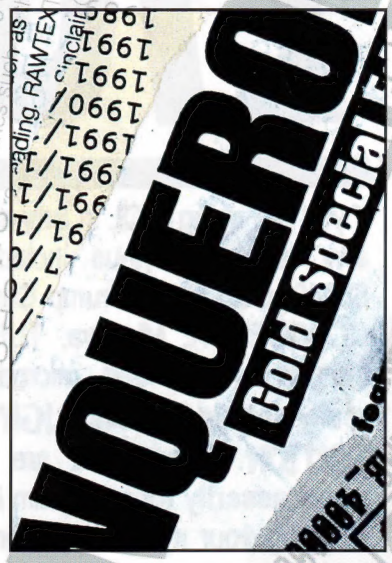
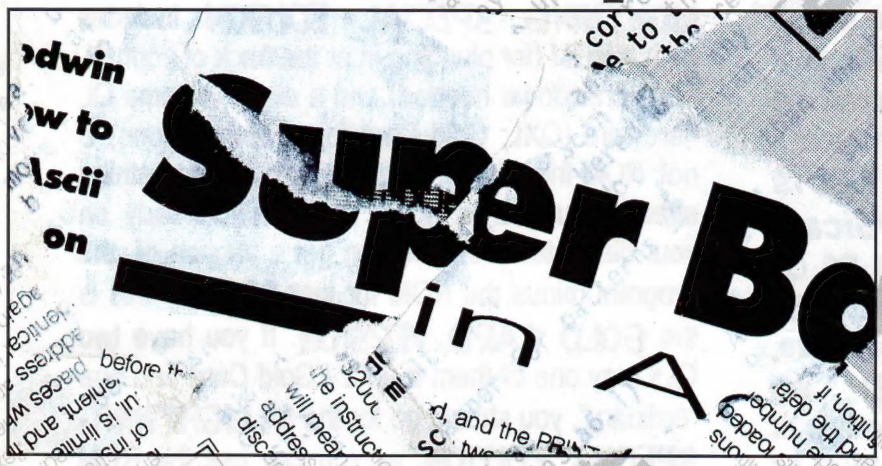
March 1993 Price £2.50

SINCLAIR QL WORLD

PC CONQUEROR SPECIAL EDITION REVIEW



SUPERBASIC part 3



BEGINNERS MACHINE CODE 2

HARDBACK AND FINDER REVIEW

MISSING IN ACTION

ISSN 0951-9335

DIGITAL PRECISION

THE FANTASTIC SPECIAL EDITION OF LIGHTNING

DIGITAL PRECISION

The Program for Everyone

If you are using a QL in **any** shape or form or with **any** accessory (thus including the new QXL 68040, Gold Card, Trump Card, ST/QL, Thor, PC CONQUEROR, Minerva, TURBO, and even the humble unexpanded microdrive-only QL), you **really should** be using **LIGHTNING SPECIAL EDITION**. If not, you are very severely and **unnecessarily** (our program is quite inexpensive) slugging your system's performance. The superb **LIGHTNING SPECIAL EDITION** will both automatically and very significantly accelerate almost every aspect of QL operation - whatever it is you use the QL for. ***"More than 10x is achievable and 2x-4x is typical"*** *(quote from page 24 of review in April '90 QL World).* The speedup ratio is independent of the system. However fast or slow your hardware, **LIGHTNING SPECIAL EDITION** will accelerate it much further. All recent versions of our software are carefully optimised for 16/32 bit processors, without compromising 8 bit working. The program has not got any adverse side effects at all, and it fixes QL anomalies. Installing it is a fast, once-only operation that takes two or three minutes and which assumes & requires absolutely no knowledge of programming or of anything even remotely technical about the QL: you are simply asked whether you wish to speed up text, maths and graphics individually, or **everything**. Unless you have a very good reason, opt for everything! Then **LIGHTNING SPECIAL EDITION** copies itself onto your boot-up disks, instantly modifying their **BOOT** files. Now every time you start up, full throughput acceleration is automatically invoked and everything goes much smoother and faster. In case you think that this is too good to be true, we quote verbatim the concluding para of the Sinclair QL World review: ***"I could not fault LIGHTNING SPECIAL EDITION on anything. It is a clear winner and a best buy at £49.95"***. The program includes a bundle of accessories (change fonts etc. in Quill etc., smooth scrolling and much more) and tweaks (vary maths and/or graphics precision, a null device and much more). Stop reading the manual where we tell you to - at around page four - if simple use is all that you want. The program also includes 84 excellent small fonts for use with both **PERFECTION SPECIAL EDITION** and **PROFESSIONAL PUBLISHER**: a real bonus!

LIGHTNING SPECIAL EDITION includes both a ROM (for plugging in at the back of your QL - no screwdriver needed) and a disk. As some QL hardware (QXL; Gold Card for speed reasons) is not ROM-friendly, or you might have something already plugged in (ICE, TK2 if not already on your disk interface), you can get a version of the program minus the ROM for just **£39.95**: this is the **GOLD CARD VERSION**. If you have two QLs, say one of them a QXL / Gold Card and one "ordinary", you should go for the full **LIGHTNING SPECIAL EDITION**, as you can use the ROM on the second machine. Extra ROMs cost £10 if ordered at the same time as the program, else £15.

Q1) What programs benefit from **LIGHTNING SPECIAL EDITION** (LNGSE)? **A)** All, including emulators. Perhaps PERFECTION SE benefits most. **Q2)** Why didn't you build it into all your programs? **A)** It would be very inefficient to do so because of multitasking. Also, LNGSE benefits all programs (even Quill etc.), not just our ones. **Q3)** Does the QL "know" it is running LNGSE? **A)** No. And it isn't "running" LNGSE either. In its first and only second of life LNGSE pages out, using a door deliberately left open by the QL's forward-thinking designer, large chunks of QDOS (AH, JM, JS, MG and all Minerva operating system variants) and replaces them with our fine-tuned supercode. **Q4)** Is it a compiler? **A)** No - TURBO is. LNGSE greatly improves the performance of TURBO'd programs too! **Q5)** Why is LNGSE so cheap? (happy users ask this) **A)** The truth is, we know that once you have experienced **LIGHTNING SPECIAL EDITION**, you won't abandon your QL. As **THE** QL software publisher, that is rather good news for us. **Q6)** Give me one more reason for buying it. **A)** Look at our **SPECIAL DEALS**, and think. Even before any seasonal discount, LNGSE Gold Card would add a mere £30 to the price of PERFECTION PLUS SPECIAL EDITION, for example. **SPECIAL DEALS** allow you to get programs for free, even to get us to pay you to buy them...

SINCLAIR QL WORLD

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March 1993

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PERFECTION SPECIAL EDITION

POWER

PERFECTION SPECIAL EDITION has 253 (two hundred and fifty three) direct/menu commands (not counting options in sub-menus), plus 32 special characters (like Bold on) that can be inserted 'directly' plus intelligent (and now excellently documented) macros. Comparisons with other word processors on the subject of power are hence quite unnecessary.

EASE OF USE


PERFECTION SPECIAL EDITION

PERFECTION SPECIAL EDITION

Independent reports, customer feedback and published reviews (of its less able but still excellent predecessor, PERFECTION) leave one in no doubt as to which word processor is friendliest – PERFECTION SPECIAL EDITION, with its intuitive, silky handling. Uniquely, it has two operating modes, with both menus (visible or invisible – they even look like Quill's) and direct commands (for when you familiarise yourself with the system). Uniquely, both modes are 're-entrant' (so you can use any menu option or direct command while you are in the middle of performing another option or command – block handling, etc, becomes a dream). Uniquely, PERFECTION SE has fully automatic memory management, grabbing and releasing RAM instantly as your document grows or shrinks – programs without this don't take full advantage of the multi-tasking abilities of the QL! Uniquely, PERFECTION SE leaves you in the driving seat, not juggling things around 'underfoot' while you are typing. Uniquely, PERFECTION SE allows up to nine different documents to be handled simultaneously from one copy of the program – each with totally independent margin, tab, justification, control panel, etc, settings. Uniquely, each document can itself have up to six environment settings, each settable or recallable instantly with a single keypress combination. Each document can have any number (up to 500,000 on GOLD CARD) of candidate blocks! Each document can have two independent windows (of any depth, of any (but same) width across) 'on to' it, even with overlapping text – that allows you to edit in one place while viewing another, to compare 'before editing' with 'after editing' (you can arrange to have one window remain 'frozen' in time), etc. Uniquely, we realise how much faster it is to type in something like CTRL/SHIFT/F5 than (say) F3 D U – both involve three keys, but as the former doesn't require the keys to be pressed in just one specific order, or to be released in any order at all (together will do), it is in practice twice as fast as the latter, where no key may be pressed until its predecessor is released. Also, sequences like CTRL/T (top) and then CTRL/G (go to next occurrence of string in set direction) can be accomplished by holding down CTRL and then tapping T and G. Uniquely, by providing eight user-definable strips, PERFECTION SE allows you to cope with printers of the future, not just the printers that now exist – you can attach the strips to any printer features. Uniquely, PERFECTION SE's status lines give full information on all relevant global settings. And the manual has an index. Also, it has all the important bits at the front.

PC CONQUEROR GOLD SPECIAL EDITION – This terrific new product for QLs with 1.5 Mb or more makes your QL system into a PC. A well-equipped PC too, with about a megabyte of expanded RAM installed, and the ability to read, write and format SD/DD/HD/ED disks (the last by making them into pseudo hard disks). Disk performance is up to 5 times faster. Other performance is up to 55% faster than standard CONQUEROR on GOLD CARD. There are many extra features too – see our ads in June - September 1992 QLW for full details.

DR-DOS V 6.0 – The latest and most capable DOS of all!

QMATHS MATHEMATICAL SYSTEM PART TWO – An excellent complement to QMATHS, with loads of 'functionality' – fractals, function evaluation, terrain plotting, masses of maths & stats, etc.

QUICKLASER – The definitive output tool from PRO PUBLISHER to HP LaserJet II (or compatible) printers. Printed output quality subjectively exceeds that from any other QL product.

TRANSFER UTILITY SPECIAL EDITION – Does everything – 16 case change options, 14 types of sorting (multiple sorts possible), auto string translations, etc.

LIGHTNING SPECIAL EDITION GOLD CARD VERSION – See June-Aug 1992 QLW for details: optimal speed from GOLD CARD, ST/QL, THOR XVI. Free upgrade from the ROM SE version (return ROM + disk) if you are ordering something else at same time: if not, £10 charge.

SUPERB PRINT QUALITY & FLEXIBILITY

Uniquely, using the aforementioned automatic link, you can output PERFECTION SE documents using over a thousand fonts (a huge variety of styles and sizes, supplied on the PUBLISHER and TOOLBOX disks) on virtually any printer – from the humblest Epson RX80, Brother M1009 or Star LC10 (which are all single font machines when used with most word processors) to top-end lasers. ***You are not limited to the fonts built into the printer!!*** All PERFECTION SE **bold**/underlined/ *italics*/^{super}/$_{sub}$, etc, settings are preserved. Proportional spacing and micro-justification are automatic, even when you mix fonts of differing widths ***and heights*** (even on the same line), vary line spacings, etc. Uniquely, you are not trapped with one type of micro-justification (ie adding all the space between words, and using the predefined widths of characters as their separation) – with our system, you can vary (in 5% steps) the ratio of micro-spaces added between words to that added between characters (the latter in proportion to their *individual* widths). Ratios around 65%-35% – not the 100%-0% forced upon you by some other word processors – seem to give the most pleasing results. Uniquely, you are not limited to mere rectangular columns plus headers/footers – that's all the rest can do – you can output in any sequence to any number of frames (text flowing from one to the next), each of any shape – irregular polygons of up to 66 sides, circles, multi-column or part-column boxes (hundreds of types of borders, thousands of textures), doughnuts, wrap-around shapes, even re-entrant ones ('join-the-dots' type borders, even with intersecting edges) – all with micro-justification and proportional spacing! Look at the example on this page. Of course, if super-fancy effects (like wraparound windows and mixing different font widths on the same line while maintaining right justification) are not of the essence, PERFECTION SE's direct printer output is excellent with all your printer's capabilities supported.

THE FASTEST

For benchmarking, we've used a public domain version of the first book of The King James Bible, all fifty chapters of the book of Genesis. This came to **one hundred and forty pages**, well over **forty two thousand words** excluding headers and footers, well over **two hundred and twelve thousand characters** excluding justification ones, **fifty full chapters** and **one thousand five hundred and thirty three indexed verses**!! We didn't use a smaller file (as used to benchmark other programs) as PERFECTION SE's timings for most operations then become impossible to stopwatch (too fast!). The hardware used for all timings was GOLD CARD: speeds would be **further improved by over three times** using the ST/QL 030. Of course, LIGHTNING SE was used. File operations were to ramdisk: normal slave blocks would give identical times. All settings on **everything** were for maximum speed, except where indicated to the contrary – we do not force full speed upon you in operations like scrolling and global Search & Replace. PERFECTION SE's speed for these is switchable (at run-time and when configuring), as too great a speed may cause overshoot (with scrolling) or fatal alteration (if there is human error inputting the target or replace strings). Here are the benchmarks for this huge document:

Load 140 pages: 0.6 seconds (yes 0.6, not 6!) ☆ Import 140 pages: 0.6 seconds (yes 0.6, not 6!) ☆ Save 140 pages: 0.5 seconds (yes 0.5, not 5!) ☆ Export 140 pages: 0.5 seconds (yes 0.5, not 5!) ☆ Case-sensitive search from top for word at bottom: 0.4 seconds (yes 0.4, not 4!) ☆ The same, but case-insensitive: 0.5 seconds (yes 0.5, not 5!) ☆ Case-sensitive search backwards from bottom for word at top: 0.4 seconds (yes 0.4, not 4!) ☆ The same, but case-insensitive: 0.5 seconds (yes 0.5, not 5!) ☆ Automatic Search & Replace, in Fast (No Query) mode, of last 600 occurrences: 7.4 seconds (same length replace string); 7.7 seconds (shorter replace string); 10.5 seconds (longer replace string – longer time as we deliberately chose a high *density* of replaces to handicap PERFECTION SE into auto-managing memory – without causing any heap fragmentation, but still with only a 0.005 second overhead per replace!) ☆ Automatic Search & Replace in Slow ('Querying') mode: arbitrarily slow, typically 30 times slower – because we deliberately allow for human response time (in case you want to abort) before proceeding from one replace to the next. ☆ Scrolling 100 lines of text, up or down, by full-width screen page: 1.5 seconds ☆ Scrolling 100 lines of text on full-width screen, line by line, in slow (full) mode: 5.7 seconds (down)/5.8 seconds (up) ☆ As above, but in medium speed mode: 4 seconds ☆ The same, but in fast mode and default settings: 13.5 seconds to scroll through the whole massive document, averaging 0.23 seconds per 100 pages (!) – and this could be made up to ten times faster by reconfiguring PERFECTION SE ☆ Reformatting paragraphs, changing margins, justification, etc, of existing text: c5 times faster than predecessor ☆ Inserting (or undoing) emphasised, underlined, italics, superscript, subscript, 8 strips, 6 environment settings: Instant (i.e. immeasurable) ☆ Navigation to line or page or to top or bottom or to 8 markers or to highlights/blocks: Instant ☆ Setting new margins, justification, etc: Instant ☆ Deleting block of 100 pages: 0.3 (yes, 0.3 not 3!) seconds ☆ Copying/moving block of 100 pages (not just 10!), downwards or upwards: 3.4 seconds (yes, including all the time for automatic memory management and anti-fragmentation – other programs are light-years behind) ☆ Spellcheck as you type: Ten times faster than anyone can possibly type ☆ Spellcheck all 140 pages in the document using the 350,000 word Mega Dictionary: 3.9 seconds (20 'errors' – like 'pluckt'!) ☆ And using our tiny dictionary (well, tiny by our standards – large by comparison with most others): 5.1 seconds (566 'errors') ☆ Time taken to create user dictionary from the results of the second spellcheck (566 errors): 0.8 seconds to extract all 'errors' from document and clean document; 1.9 seconds to create a full user dictionary therefrom and also a sorted, duplicate-free wordlist file (for browsing) ☆ Spellcheck file (ASCII or native): Even faster. ☆ Print first 10 pages to file: 3.5 seconds. ☆ Change every occurrence in 140 pages of God to ***God*** in bold underlined italics, strip 8 – 9.5 seconds! ☆ Virtually everything else: instant.

For prices, see the coupon page of our ad. For more info, read our detailed QLW ads in early 1991 for PERFECTION, plus the extra features of the SE (well, about half of them) listed in the June-August 1992 issues. You can upgrade from the standard PERFECTION (or PLUS) to the SPECIAL EDITIONs for the difference in current price, plus £10 : no manuals or dictionary disks to be returned – we'll send a supplement to the manual.

PERFECTION
PERFECTION PLUS

Perfection is the finest word processor available for any computer. We have received dozens of letters from happy users saying just this... and all of these letters were unsolicited. "Superb" was used most often.

Perfection manages to achieve all the sophistication of the most complex PC word processors while still using a user interface as friendly as Quill's. Perfection has a dual system of user control: menus while you are familiarising yourself with the program, and direct commands for the time when you feel ready for more adventurous things. The two systems can be used interchangeably and even simultaneously. Even more exciting – both systems are iterative. In case you don't understand what this means, let us give you an example: suppose you wished to move a block of text using the menus. You would choose Block Move (yes, it is right in the first menu) and the screen would then tell you to move your cursor to the start of the block. On most word processors you would have to navigate manually to this position: indeed, on many of them (Quill included) only a subset of the normal navigation commands would be available. On Perfection, not only can you use all the manual navigation commands (viz all 28 permutations of CTRL, ALT, SHIFT and the arrow keys!) but in addition you can use direct commands like GoTo Line or Page or any of eight markers. Even more amazingly, you can use Search (either as a direct command or from the menus) *even though you are already 'within' a menu option.*

Perfection has about 200 commands, but the layout of menus and the choice of keys for the direct commands makes it very easy to master. Though a 100+ page manual is provided (with all the important bits right at the front), you should only need to consult it for specialised operations like macros.

Even if speed is not particularly important to you, we assure you that Perfection's lightning performance will enable you to use the word processor in sensible ways that you would not have dreamed possible before. For example, scrolling 100 pages or so is accomplished so quickly using the normal navigation commands that you do not need to bother using a menu option to do the move. Spellchecking, assuming you have Perfection Plus, is accomplished virtually instantly: to spellcheck this whole ad (all the pages) would take under 1.5 seconds... Searching (you can switch case sensitivity, as well as equivalences between tabs, soft spaces and hard spaces) is at the rate of about 100 A4 pages per second.

Moving from one word processor to another is usually very traumatic. With Perfection, this will not be the case. Not only can Perfection read in Quill _doc and _exp files directly (you do not even need to tell it they are Quill files!) but it can make direct and immediate use of your existing Quill printer driver. File re-export is also possible.

Perfection is truly WYSIWYG: this means that bold appears bold on screen, italics appear as italics, underlined as underlined, and so on. Of course, your printer may have functions we do not know about (upside down?). To deal with these, Perfection provides a number of on-screen shaded strips: these can be attached to any printer function you wish, and will not upset justification as a translate would. Of course, translates are provided as well!

A variety of statistics on the document being processed are available: some of them are on view all the time, the rest can be toggled to instantly. Not only is there a word count, but also page, line, character and special character (like Superscript Off) counts. There are also a dozen status indicators, letting you know whether you are in Insert or Overwrite mode, whether a block is defined, whether interactive spellchecking is enabled etc. Current line (from top as well as within page) and column positions and character codes are also available.

A terrific feature of Perfection is the dual screen mode. You can view one part of the document while editing another. The sizes of the two windows are themselves adjustable, both in real-time or via the configurator. We should devote more space to the configurator: however, it must suffice to say that everything that could be dynamically set within Perfection may also be preset with the configurator. The configurator can, for example, allow you to select any of 256 colours for any of a dozen parameters (like paper colour, border colour, status window ink and paper colour etc).

Perfection is fully multitasking without need for any external accessory: however, if you already use QPAC or Taskmaster or similar and are happy, you may go on doing so.

There is absolutely no way that we can prepare you for the quality 'feel' of Perfection. We have a great deal of experience using PC word processors costing many hundreds of pounds: with absolutely no exception, Perfection is far easier to use and master.

So if you thought Perfection was unattainable, you have a very pleasant surprise coming to you!

LIGHTNING SPECIAL EDITION
LIGHTNING

These programs accelerate QL operation by up to 10x (2x –4x is typical) without having any adverse effect whatsoever on compatibility or anything else. Lightning SE is typically 40% faster than the standard version. This acceleration is totally independent of, and in addition to, any speed-up obtained by hardware means. So if you have Gold Card, your need for Lightning SE is just the same as if you had only an unexpanded QL – Lightning SE will accelerate both by the same ratio.

The Lightning programs achieve their acceleration by automatically paging out sections of the QL's operating system and replacing these with optimal, concise code written by us.

Lightning installation is a completely automatic and one-off: no knowledge of computing or programming is required. Once installed, Lightning can be completely forgotten about – you will soon get used to the superb speed! Knob twiddlers are catered for too.

Lightning technology is not built in to any of our other programs. Perfection users (as well as users of all other QL software) should therefore use Lightning all the time.

In summary: if you do not have Lightning, you are wrong. Buy this one **FIRST OF ALL!**

PROFESSIONAL PUBLISHER

The Professional in Professional Publisher refers to the quality of output from that program, and is not meant to suggest any complexity of operation. Few programs are as easy to use as this one: > 99% of users will be able to do without using a manual!

DIGITAL PRECISION LTD

Professional Publisher is by far the best DTP program for the QL. It is fully compatible with Perfection, Editor, Quill, Eye-Q & the ASCII editors. It allows you to *both* create and import *both* text and graphics. Text can be 'poured' into boxes of any shape , size and number, automatically maintaining justification and hyphenation settings. So flowing text around graphics is a doddle.

Professional Publisher is supplied with a generous selection of fonts of various sizes, as well as clip art.

Justification is by pixel, not by character. This gives a much smoother effect.

It is pointless for us to try to list all of Professional Publisher's features – we would end up filling half the magazine! We will concentrate on just a few 'points': Professional Publisher is extremely precise, performing all its computations accurate to a small fraction of a millimetre. All its features can be preset by you using its configurator, ruling out the need for repetitive key strokes.

The program is extraordinarily versatile while remaining intuitive in its user interface. Buy it!

PROFESSIONAL PUBLISHER
TOOLBOXES

Toolbox I is an excellent collection of high definition fonts, clip art and utility programs for Professional Publisher. While the fonts supplied with Professional Publisher are excellent, many users will feel the need for a wider range of typefaces and styles.

Toolbox II starts where Toolbox I leaves off, providing an even better – and different – font collection.

The two Toolboxes complement each other and are available together at a special price.

FONT ENLARGER
GRAFIX

Font Enlarger does exactly what you would expect it to from its name. While Professional Publisher is also capable of enlarging fonts, it does them 'on the fly' and consequently is not able to remove the jaggedness caused by magnification. Font Enlarger is much cleverer, and enhances detail without any step effect.

While the built-in printer driver for Professional Publisher is excellent with 9-pin printers, it is not optimal with 24-pin or laser printers. Grafix is.

DIGITAL PRECISION LTD

EYE-Q
ULTRAPRINT

Eye-Q is the finest graphics program for the QL. While there may be other graphics programs with a few more features, no other program comes anywhere close to Eye-Q in sheer enjoyability. Eye-Q develops a pleasurable tactile relationship with you, and makes you feel like an artist (even if you aren't). Eye-Q graphics can be read in by Professional Publisher, and the latter's pages can be exported to Eye-Q (using Toolbox I). Everything in Eye-Q is menu-driven and there is context-sensitive help.

While Eye-Q has its own printer driver, Ultraprint allows you 22 distinct styles/sizes of printer output. The reasoning is that the scale of gradation suitable for pictures is probably unsuitable for text or line drawings.

PC CONQUEROR
SOLUTION

PC Conqueror makes your QL into a PC-compatible machine,automatically. It does this by software means only, so there are no screws to undo or wires to fiddle with. Your QL stays a QL too.

Why, might you ask, should you wish to make your QL into a PC-compatible? The reason is simple: you may wish to run the same programs at home as you do at work. Alternatively, you may wish to tap into the vast storehouse of PC software of every type and description you could imagine.

Using PC Conqueror could not be easier. Just boot up your machine with the PC Conqueror disk in floppy 1 and within 10 seconds your QL will be transformed into a PC that is just waiting to be switched on. From this point on you will do exactly the same as you would if you were running a 'real' PC – this means putting a DOS disk (any version) into one of your drives and pressing a key. If you do not already have legal access to a copy of DOS, we can provide you with one at reasonable cost (see our price list).

PC Conqueror runs as fast as it is possible for a PC emulator to run: we have used all our skills to make it work quickly. Of course, you can make the emulation must faster by using Gold Card and Lightning SE. With this combination, you should get speed noticeably better than that of a PC XT...

PC Conqueror allows you to fine-tune the operating environment of the PC in order to improve performance. If you get a hard disk or other high capacity floppy system, you can utilise part or all of it as a PC hard disk.

PC Conqueror occupies under 80K and leaves 667K free for DOS when run on a Trump Card. This is more than you will get on a 'real' PC.

Solution does what Conqueror does but is about half as fast and is not quite as compatible.

SPELLCHECKER
MEGA DICTIONARY

Spellchecker is what makes Perfection into Perfection Plus. We have made it available as a separate item for two reasons: (a) to allow Perfection owners to add it later (b) to allow users of other word processors to benefit from the very best in spellchecking technology.

Spellchecker is supplied complete with three dictionaries of differing sizes as well as a system for building, reviewing and maintaining user dictionaries.

Spellchecker's ultimate accessory is the Mega Dictionary, which gives the user a vocabulary of over 350,000 words!

3D PRECISION CAD SYSTEM

This program allows you to manipulate shapes and figures in 2D and 3D at a speed that will leave you breathless. Irrespective of whether your interest is in CAD, in animation or in just having fun, this program should not be missed. You can output to plotters directly from it, or alternatively create graphics screens to be manipulated and output by Eye-Q, Ultraprint or Professional Publisher.

SUPER SPRITE GENERATOR

SSG moves things about the screen very fast and very smoothly, without flicker. Sprites can have up to 16 frames.

MEDIA MANAGER SPECIAL EDITION
MEDIA MANAGER

Media Manager Special Edition (MMSE) is a program to be used both when things have gone wrong as well as when things are perfectly OK. It allows for automatic, semi-automatic and manual correction of a huge variety of disk and tape problems. It allows you to explore disks and tapes to your heart's content, producing all sorts of different diagnostic reports. MMSE is very simple to operate, being menu-driven and assuming no degree of computer knowledge whatsoever.

MMSE also allows you to tidy, catalogue, sort and order your disks and cartridges.

The standard Media Manager is both less powerful and less user-friendly, but manages to work on an unexpanded QL.

Both programs allow for data transfer between PC and QL. With MMSE, this transfer is at file and directory level, is bi-directional and is completely automatic.

SPECIAL DESKTOP PUBLISHER
DESKTOP PUBLISHER

These programs are quite primitive compared to Professional Publisher. However, if you have not experienced that program as yet, you will find both of these very competent. Both are capable of producing excellent results. The cheaper one has fewer features but is able to run on smaller systems.

EDITOR SPECIAL EDITION
THE EDITOR

With the sole exception of Perfection, this is the best word handling system on the QL. Editor's features include an unrivalled degree of programmability and the ability to cope with the entire 256 character ASCII set. The Special Edition has enhanced document-type facilities, including column blocks and on-screen page break displays. Neither program is suitable for computing novices. Until Perfection, Editor Special Edition would have been our 'Desert Island Program'.

Editor SE can do a few things that Perfection can't, so the ideal combination is to have both (they are compatible at file level and can multitask). If you order Editor SE at the same time as Perfection, you can have Editor SE at half price.

PROFESSIONAL ASTROLOGER
PROFESSIONAL ASTRONOMER

The Astrologer program teaches you Astrology from scratch and enables you to automatically produce text narrative on personality delineation, year-to-year and minute-to-minute life predictions, compatibility interpretations and so on. Whether or not you believe in astrology – indeed, especially if you do not – this program is one that you cannot afford to have. You can tailor the readouts (both in terms of quantity and what is said) to your own particular requirements. The amount of fun you can have with this program is endless. Do not blame us if you start believing in astrology, though!

Astronomer is an extremely fast and accurate solar system calculator, with planetarium views, planet faces, eclipses, cinerama display etc..

TURBO BASIC COMPILER

Turbo is the finest BASIC compiler for the QL and arguably the finest BASIC compiler for any computer!

Turbo automatically converts working BASIC programs into optimised machine code, usually with no need for human intervention. The benefits of this conversion are vastly enhanced running speed (as well as much faster loading, encryption and automatic bug fixing for a variety of QL interpreter oddities). Typical speed-up is 40x – 100x.

Turbo is provided with a 200 command toolkit, adding many useful commands to BASIC. Most of these commands will be of immediate use to the programmer, whether he is a novice or an expert. There are commands to load strings and floats into RAM, and to extract them automatically; to search memory and to move its contents; to control jobs and change their priorities, manage pipes, allocate and deallocate memory, to control both rubber and virtual arrays, to present INPUT with an editable default, to have random access to files and much more.

TOOLKIT III

Toolkit III starts where Toolkit II stopped, adding about 60 new commands and enhancing many existing dual functions. Toolkit III is available either on disk or on ROM, and works whether or not you have Toolkit II.

Toolkit III commands can, with only a couple of exceptions, be compiled using Turbo.

QFLICK CARD INDEX

All QL owners have a copy of Archive, supplied free with the QL. While Archive is competent, it is very hard to get to grips with and is not particularly fast. QFlick presents a very convenient alternative – a snappy , simple-to-use, pointer-controlled card file database. You can move data between QFlick and Archive in either direction.

QFlick is not itself programmable but we document its data structure and give guidance on how to program it using Turbo.

ARCHDEV + RTM
DATABASE ANALYSER
ARCHIVE TUTORIAL
NAMES + ADDRESSES
MAILMERGE
DAT–APPOINT
SEDIT
SCREENPRINT
RECOVER

This suite of utilities will greatly enhance your use of the Archive database system.

Archdev + RTM is a straight replacement for Archive: it gives enhanced speed, greater workspace and a much cleaner boot-up. All your existing applications will work.

Database Analyser provides very fast and comprehensive statistics about your Archive databases.

Archive Tutorial proceeds systematically through the whole philosophy and grammar of Archive, providing you with expert and patient guidance.

Names + addresses, Mailmerge and Dat-Appoint are ready-to-run, off-the-shelf Archive applications, providing an address database, mailmerging and appointment diary respectively. You now have no excuse not to use Archive.

SEdit allows you to create and edit screen format files in Archive. Screenprint allows you to print them out.

Recover allows you to get back lost Archive databases, created when you switched off the computer without properly exiting from Archive.

XREF
SUPERBASIC MONITOR
BETTERBASIC EXPERT SYSTEM

XRef analyses the structure of a BASIC program, providing detailed reports on things like variable usage, what calls what, dynamic call hierarchy of procedures and functions, and so on.

SuperBasic monitor actually monitors and reports on the performance of BASIC programs as they run under the interpreter.

BetterBasic analyses and automatically corrects structural flaws in your programs and allows you to customise things like indentation, number of statements per line, filtering out of noise words, etc.

The three programs together provide a matchless diagnostic and auto-correcting facility for BASIC programs.

TRANSFER UTILITY

This program copies files at high speed between devices, performing translates as it goes along. Ideal for all sorts of applications, including transfers from microdrive to disk.

QMATHS SYSTEM

This is an incredible mathematical compendium for the QL. Pride of place goes to the symbolic problem solver: this can solve equations, simplify expressions, factorise, expand, etc, all symbolically. If you could sneak this one into a maths examination, you would have a formidable ally. QMaths knows about all the algebraic operators, powers, roots, brackets, trigonometry, matrices, determinants, vectors, factorials, permutations, combinations, binomials, exponentials, logarithms, hyperbolics, inverse functions, infinite series including Taylor & Maclaurin expansions, complex numbers, conversions, Fourier series, and lots of calculus: both differential and integral, including integration by parts and definite integrals. QMaths optionally displays its workings and comes with a superb interactive tutorial.

The package also contains an interpretive, fractal, image-generating language with loads of beautiful fractal programs supplied for you to use and edit – no programming skill is required.

There is also a multiple precision floating point maths package, giving calculations at precisions up to over 600 decimal digits of accuracy.

There is even more to this system, but we think we have told you enough.

QMON MACHINE CODE MONITOR

The latest version of Tony Tebby's superb monitor: an absolute must for those who really want to know what is going on in the QL. No other machine code monitor even comes close.

Do not confuse this program with SuperBasic monitor, which monitors SuperBasic, not machine code.

COMPARE

This program compares files – data or program – at colossal speed. Where a mismatch is detected, the relevant areas are highlighted and you can shuffle, displace and align very easily.

CASH TRADER WITH ANALYSER
PAYROLL

Cash trader with Analyser is an accounts system designed by businessmen and not by wretched accountants! Consequently, it has excellent reporting and management facilities, and is very flexible. It is aimed primarily at the layman, probably a sole trader running a small or medium sized business. All the features you would expect – including audit trail – are present.

Payroll is a reasonably flexible system designed to automate the payroll function in small businesses.

Both programs are configurable, with editable defaults letting you adapt the programs from year to year.

HARDBACK WITH FINDER

This is the ultimate hard disk backup and management utility, with all the sophisticated features you could want. User dialogue is via overlapping pop-up windows – the whole program just feels right. It is possible to scan the disk at great speed, too.

DISKTOOL WITH QUICKDISK

This permits you to add password protection to disks, to optionally increase disk storage capacity on DSDD drives by 36K and to increase speed of access by as much as 30%. All this is done while maintaining full compatibility. Automatic file management is also provided.

DIGITAL C SPECIAL EDITION
DIGITAL C

These are extremely fast and efficient C compilers, complying with and surpassing the Small C definition. The Special Edition goes much further, including support for structures, pointers, long pointers, >64K code size, direct access to QDOS traps, etc. The Special Edition C generates code that runs about twice as fast as the other.

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CPORT IMPROVED VERSION

A brand new CPORT system, enabling you to rapidly convert your SuperBASIC programs into C (ANSI or Lattice). The new (October 1992) version is now as close to being fully automatic as makes no difference – you must get it!

Owners of our earlier CPORT versions should return disk + SAE for a free upgrade.

SUPERFORTH COMPILER WITH REVERSI

Forth is the most logical computer language. This compiler produces multitasking code. The manual teaches you Forth-83 from scratch.

IDIS SPECIAL EDITION
IDIS

These intelligent disassemblers make the otherwise terrifyingly complex task of understanding other people's machine code programs absurdly easy. The SE version, which has a higher hardware requirement, sorts out some routines, replaces addresses with names, untangles data from code and much more.

QKICK FRONT END SYSTEM

This is a simple, easy-to-master, pull-down menu controlled multitasking front end. QKick runs in the background and can be called up at any time. It provides you with notepads, sophisticated file/sector/RAM handling, backing up facilities, a clock, diary, calculator, mini-database and so on.

ADVENTURE CREATION TOOL SPECIAL EDITION

ACT is a must for every programmer. The name of the program is misleading, insofar as it has capabilities far beyond the 'mere' creation of adventures. ACT has utilities providing animated graphics, data compression, language design, parsing, maps, object-oriented control etc. If all you want to do is generate adventures, though, you do not need to be a programmer to use it. This is a purchase you will never regret.

PEDIT

A fast, modern and capable printer driver for the programs bundled with the QL.

MICROBRIDGE

Superb contract bridge bidder (ACOL etc) and player, using millions of random but reconstructable hands. Microbridge also includes a state of the art interactive bidding tutor and a clear instruction manual. There is nothing like this anywhere else!

SUPER ASTROLOGER

A very cut-down version of Professional Astrologer – still great fun, though!

SUCCESS CP/M EMULATOR

Allows your QL to run CP/M programs at great speed.

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TROUBLE

Bryan Davies is trying to get everything to work with everything else, as usual.

You would not expect to see the QL mentioned in a PC magazine, but the magic letters appeared in the December issue of one of these. The reason was rather surprising. The writer was complaining about the awful inevitability of problems with printing. The printer works fine with one program on one computer, but not at all with the same program on another specimen of the same type of computer. Or it works with one program, but not another, on the same computer. It all sounded very familiar. What was unexpected was that the writer was aware of the likely cause of some, at least, of the trouble - he is an enthusiastic user of the Psion XChange suite, Quill in particular.

New and old

When your printer is much newer than your application program, you can certainly expect trouble. We still live in a computer world where almost every program has its own, special printer-driver file. Some serious attempts have been made to address this major problem, notably on the Apple Macintosh and with Windows on the PC. They have only one printer-driver for each type of printer, and that one file is used by all their application programs. (Assuming they recognise it - Ed.) The Mac is possibly the best-integrated of computer systems, but many other micro-computers cannot sensibly be called part of a "system", because there is little, if any, overall control of how the software is written.

The poor soul on that other magazine could see what was coming - he would be forced to "upgrade" to a more-recent wordprocessor, that would turn its nose up at his large collection of Quill files. He would then be left with an archive of useless files.

That, of course, is another major bone of contention for micro users. Why is it that it is so hard to transfer files from one wordprocessor to another, without losing formatting information and (sometimes) text? Anyone who has tried loading QL Quill files into another wordprocessor will be aware of the special nature of those files, and it is likely the same applies to the PC version. (Before rockets start flying in my direction, I must state that both Perfection and Text87 Plus-4 now handle Quill _DOC files quite well!)

Day of trial

In fact, it may be that the writer was being unduly pessimistic, but my attempt to convince him of this was not successful. He pointed out that there were hundreds of files, and writing some sort of macro routine to enable this job to be done without operator intervention would probably take a day or so.

We often use programs which have not been updated for some time, and they can start to seem a bit inadequate when we get new hardware, for which they are unsuited. The arrival of the laser printer has shown up the lack of printer-drivers with some programs. Digital Precision has plugged the gap for Professional Publisher by introducing QuickLaser, a separate program to send ProPub output to printers which emulate the Hewlett-Packard LaserJet Series II. A few tests with the program showed it to be simple to use and very effective. It takes typically 10-15 minutes for a full 1920 x 1600-pixel page to be printed, but that is presumably a function of the printer rather than of the program. The quality of the output is high; in particular, the grey-scales and pattern-fills used in some of the fancy founts come out impressively well (see the illustration). Yes, laser printers are still pricey, but you soon put the dot-matrix out to pasture when you sample really good printout.

We don't get many letters complaining of compatibility problems with the Minerva rom these days, but that does not mean there are no problems, apparently. The complaints passed to me all relate to old-established programs, which work correctly with the QL rom chips, but not with particular versions of Minerva. When there are new developments in a computing field, compatibility is likely to be a problem with some items at some stage, whatever the context. The message is, if your program works ok before you fit Minerva (or any other upgrade path), there is no point blaming the suppliers of the program if it gives trouble afterwards. The problem is so well-known, and Minerva sufficiently widely used alongside programs that don't work with it, that you can buy a "rom-switcher' unit to allow you to use one roms without having to disconnect the other one.

Hole disks

Following a discussion with a local QL enthusiast, Ernie Hurkett, some of my 3.5-inch DD disks were subjected to a bit of abuse. They each had a hole drilled in them. Before that was done, they were tested in a standard HD drive, to see if they were recognised for what they were (at the time) - DD disks formatted to HD. To my surprise, a few of them were actually recognised simply as HD. I don't know why; they didn't have the tell-tale square hole, and there was nothing that distinguished them from disks which were not recognised as HD. (Lamarkian evolution?) All of the batch were then drilled with a (round) hole, at the location where HD disks would have their square recognition hole. They were then formatted as HD successfully. So far so good.

The next step was to go through my whole stock of DD disks (about 500), drilling them all, then reformatting them as HD. That process is about 50% complete at the time of writing; apart from a (very) few of the disks which either had to be reformatted more than once to get rid of a few bad sectors or had to be accepted with less than full HD capacity, all of them gave full capacity first time. (Bear in mind that they have all been in use as HD disks for several years anyway, in a drive that does not have an optical sensor for disk type).

If you have bought disk drives for the QL from Miracle Systems, you are likely to have read a note concerning possible problems using disks of higher nominal capacities than the drives. For example, you cannot be certain what capacity HD disks will be formatted to by DD drives. My concern was a different one - would ED drives be able to tell that my HD disks were not genuine ones? The answer, so far, appears to be no. The drilled disks were formatted to HD in the ED drives, and behave normally. These disks were formatted using the Files utility in TaskMaster, which means no special parameters were attached (by me) to the Format command; it was left to the ED drive and the Gold Card rom to decide what capacity to select. Many of us have read articles about differences between DD and HD disks, and there may be some truth in what is said, but my own experience suggests that marketing is the main difference between the disks.

But there is a tailpiece to this - one of the "holey" disks was sent to Freddy Vachha at Digital Precision. My PC had reported the disk as 100% good at HD; his QL and PC both reported it

SHOOTER

to have a lot of bad sectors! Since then, further checks with 3.5-inch drives have revealed quite surprising incompatibility, mainly in the form of HD drives refusing to format disks to DD. My impression now is that my "stock" consists of six drives, of four different configurations.

Porting Archive

Reference some months ago to porting Archive routines from the QL to the PC brought a response from Hugh de Saram. He feels that Archive-Plus on the PC is a good development of the basic Archive. The transfer of Procedures from QL Archive is the same as always with the original PC Archive; save them in _PRG files, change any file/directory name characters from the underscore (_) to the full stop (.) or backslash (\) using a program such as The Editor, then transfer the files to MS-DOS format with XOver or the like. The files can then be loaded directly into Archive-Plus. My recollection is that you may still have to make minor changes. There are some QL Archive commands, such as Memory(), which are not supported in PC Archive.

Making the reverse journey is less straightforward, as the Procedures may use functions which are unknown to QL Archive. Anyone having particular problems with such transfers can write to QL World and we will see if answers can be found; Hugh will very likely be happy to help, provided he has the spare time.

Another familiar figure, Peter Hamill, sent some samples of pages printed from Text87 Plus-4, as follow-up to my review of that program. He prepares a newsletter for a sailing fleet, making use of both Professional Publisher and Plus-4. The general layout, and preparation of text, is done in Plus-4. A logo, plus a square border to hold the bulk of the text, and a smaller bordered area for an advert, were prepared with Pro Pub and are photocopied, since they remain the same for several issues of the newsletter. The only problem is registration of the Plus-4 printout with the photocopied background, and that is not too difficult to achieve.

The other half

Over Christmas, I spent some time checking a couple of portable computers for a journalist who works for one of the national newspapers. It was an interesting look at how differently some people use their computers. The big difference was that he knew little or nothing about computing. He had a printer, but the only reason was that his original (Tandy) computer had such a small memory that it was necessary to print pages out as they were completed in order to release memory for the next page! His current portables were not used with a printer, being linked by modem direct to the newspaper office. Text is written on a wordprocessor, and saved in Ascii, enabling files to be sent down the 'phone lines with no conversion difficulties.

In short, he is strictly a working computer user. No playing about, either with technical matters, or games. He wasn't even sure of the name of his wordprocessor. To such a user, text format matters not at all. In fact, there were many spelling and typographical errors in his articles, but what matter when there is a sub-editor at the office to correct these, and grammar too? Of course, in technical it is remarkably easy to insert serious errors while attempting to remove little ones.

With much of the text work I do now, the format has become almost more important than the content. (Not in this office it isn't - Ed.) We can thank the success of Graphical User Interfaces for bringing some of us to this pass; there are so many pretty, seductive things one can do on the computer now. If you think that is unduly jaundiced, take a trip round a few London offices, preferably those of financial companies, and look at the documents produced by the secretaries. You may be hard put to find any that are in a single fount and size, without borders, bullets, graphical inserts, charts, logos, etc. All great news for suppliers in the computer trade, but of dubious value as far as productivity is concerned. GUIs were advertised as a "great productivity improver" in much the same way, no doubt, as computer users were once promised the "paperless office"!

Booted out

The holiday season brought with it a few problems (how many times has that word appeared in this column?). The every-day JS QL hadn't been quite right since the hard disk drive had been re-connected, with booting-up being disrupted by partial resets. Then a couple of boot disks, provided by fellow fiddlers, failed to give anything but error messages. One of them did better than that by re-setting the QL during boot-up and apparently rendering even the reset process faulty. Putting the old-faithful JM QL back in place did not seem to help at first, as it gave trouble right from the "Harris Tweed" screen, but it seemed alright later.

The reasons for the boot disks not working are obscure, but it was established that one had been used successfully on a system which had a mouse, and that mouse was connected to a SuperQ board, and that board presumably contained a rom chip which had the command POINTER on board; not surprisingly, my QL had not heard of this command. The other disk had been developed from something running on an Atari with QL emulator, and the boot contained a load instruction for an extension set used on the Atari; although this had apparently been accepted without murmur by the JS QL of my friend, it upset my own JS to the extent of instant reset. Having got rid of that instruction, we were then faced with a command that must have been part of that extension set. Stoppage again. All was ok with that command removed. So what is the problem? Nothing really, but why had that command been a necessary part of the boot for my friend's machine, at one stage, but had then stopped his machine too? I knew I should never have trusted these new-fangled JS machines...

The boot disks mentioned arrived at an appropriate time, when I was preparing to try once again to come to terms with QPac, on a friend's hard disk. Previous attempts had been abandoned, and this one did not start well; the existing Altkeys disappeared when the hard disk was connected, two review programs which use the Pointer Interface both locked up on certain functions, and there was the matter mentioned above, of missing extensions and unexplained resets. There are clear parallels with my year-long battle to get Windows working on my PC. One is my determined hanging-on to a tried and trusted utility; XTree on the PC, Files II (from TaskMaster) on the QL. A good utility program is a real friend and, in my case, gets almost as much use as the main word-processing program.

The difficulty with the reset on my QL took more tracing than expected. Four different QLs, three interfaces, and two (interface) rom chips, were tried, and the initial conclusion was that a current rom chip was the culprit. That diagnosis lasted no longer than to the next, cold start-up, when the screen and QL speaker went crazy again. Once warm, it seemed that all

the machines worked ok. That did not leave much to blame - the display unit, or the power supply. The trouble did not go away when the display was disconnected, but it did when the power supply was switched on for some minutes before being connected to the QL. So, what had produced symptoms of a flaky 8301 chip, or interface board, turned out to be something external to the QL - a noisy power supply.

User groups

The recession appears to have taken a bite at Quanta group membership, with the total dropping by nearly 300 members in 1992. The length of the current recession must have taken most people by surprise, and we all have to look at where our money goes, but the cost of Quanta membership - or the QL World subscription - is small compared to the items which really make a hole in the pocket, such as the weekly food bill, insurances, video rental, keeping the kids in computer games, etc. What is heartening is that the Quanta membership at the end of 1992 was higher than at the end of 1988 and is substantially the same as ever. Our local group (S.E. London) meetings are attracting a dozen or more enthusiasts each month, and the report in the January QL World suggests much higher levels of attendance in the Bristol area.

My second illustration was obtained from a directory utility developed by Joe Haftke of the Southeast London group. Of the irritating things about Qdos, its way of presenting a disk or cartridge directory ranks near the top with me, and many other users must feel the same. To scroll file names past at high speed, and use only half the screen, is a nonsense; it is also primitive, in not supplying any information other than the file name - no file size or date. (Note: contemporary PCs and other micros were just the same - you only get updates if someone writes them!) To compound the annoyance, there is no way of looking back through the list; you have to issue the DIR command again to see the first files on the list. Joe's utility displays a full screen of file names, with only the SuperBasic area at the bottom not being used. It allows you to page backwards or forwards through the list. You can also print what is displayed, to a file or printer. A small touch that will please many is that the display of file names does not immediately disappear when you press Esc to exit the new command; knowing that the user often wants to type-in a file name after getting a directory, Joe has left the files display there, to avoid the user having to memorise names. On a Gold Card system, the speed of presentation is as good as one could wish for. Joe hopes to market the utility and he should find a goodly number of purchasers; we get offered many small programs over the years, at nominally low prices, but few of them remain on one's system for long, whereas this looks to be one that will last.

Readers' letters

JPF Fiolet, who lives in Holland, offered assistance and wondered if the Archive-based invoicing program I was referring to when complaining about confusing programming some issues back was called "Impacct Accounting". The answer is "no", but that program used to be familiar to me, as I bought it when Eidersoft first introduced it. At that time, I spent many hours altering procedures in Impacct too, but decided that it was not the kind of thing I needed, and was not fully ready for use anyway; the outcome was that I used Abacus instead. Fiolet has been using Impacct for several years, with success. Thanks for the offer of help.

Digital Precision now has much well-sorted accounting software, but lack of more specialised software is one of the problems the QL faces in its mature years. It is all too easy to say now, "if only this had been done when the QL first came out". That is, if only we had the Gold Card then, to give more speed and memory, and if only some of the software had worked better. Another local Quanta member showed his Psion Xchange set-up to me recently, on my Gold Card-equipped QL, and the speed at which his spreadsheet demonstration ran was positively ridiculous. Having seen the demonstration on a QL without Gold Card, it was scarcely recognisable as the same thing; the screens changed so rapidly on my system that it was hard to see what was on them. Can you visualise what would have happened to the QL if the Gold Card, ED drives, and Psion Xchange had been available for it in 1984?

Snow boots

Way back in July of last year, R. Snow sent in some 5.25-inch disks, with files on them that had been recorded in a single-sided drive, each side being formatted separately. He was having difficulty getting any information off the disks, but it was not clear whether he regarded the disks as unusable. He had come to the conclusion that the problem, whatever it was, stemmed from the drive rather than the disks; he felt readability of the disks was a function of the recording level, and read-back threshold, of his drive.

The disks concerned lay awaiting attention until now, mainly because my QLs did not have a 5.25-inch drive. The only drive I had was in a heavy box, a leftover of an ancient Philips desktop system, and the prospect of making space for this monster, and connecting it successfully, was not inviting. When the task was eventually faced, the drive did not power up. The only alternative looked even more messy, but it did provide the solution. A PC was opened up and the spare drive was connected to a power cable from that, but linked to the QL for signals. All this to avoid making a suitable power supply! The drive had been standing idel in an outside shed for years, but it performed fine.

What of the disks? The QL said all of them were "not found". Formatting them gave 100%-good results - 720 KB each - for three, but only about 680 KB for the remaining one; there was no suggestion of bad sectors, which seemed odd. Copying files to them from microdrive was also successful. As a double-check, they were given an MS-DOS format, and more file copies were made, again without difficulty. This time, all four came out 100%. Three of the four disks were marked double-sided double-density, but the fourth (not the one that did not give full capacity) was single-sided single-density; no difference between the types was apparent, though.

They did have some unusual points; all had two (rather than one) registration holes by the central hub, additional cutouts on the right edge (maybe for turning over in single-sided drives), and the three DD/DS disks appeared to have less magnetic surface area than is usual. Whatever the differences, the conclusion had to be that there was nothing significant wrong with the disks, so whatever problem Mr. Snow had was likely to be with the drive, as he thought. Sorry for the slight delay!

There had to be more to that story. The disk testing was carried out at the same time as trying to sort out the above-mentioned QL resetting problem. The disks were checked on a JM QL with Trump Card interface - fine. Then the usual JS QL with Gold Card was put back in place, with the 5.25-inch drive connected. Whatever disk was put into the 5.25 drive, this QL came up with the message "read only" when asked to perform a format. Attempts to format the disks single-sided, using the command Format 'flp1_disk_name *', also failed, on both QL-plus-interface combinations. Every combination of two interfaces and two QLs was tried, but I never again managed to get a QL format onto any of the four disks. The error messages were not always the same, "format failed" being the alternative one. The only thought as to the reason for this was that formatting with MS-DOS had somehow done something to the disks which Qdos could not cope with, but this has not happened to me before. If everything goes right with a micro, something has to be wrong...

CGH LEAVES THE ARENA

Richard Alexander, proprietor of CGH Services for many years, is quitting the QL software business. The stresses of falling sales, an increasingly competitive public domain market and the lack of other work in the world at large have finally hit Richard's personal and business life, and we desires to make a new start, possibly in journalism or desktop publishing. CGH Services will stop trading actively as of 31 March 1993. The company's bank account will stay active for longer so that orders can be fulfilled and authors' royalties, etc., can be cleared. No further orders will be accepted after 31 March - cheques will either be destroyed, or returned if the orderee sends an SAE.

As CGH had a policy of publication and distribution rights only, and not copyright on programs, at 1 April 1993 all rights will revert to the original authors. Richard is attempting to ensure the continuation of CGH's QL products by advising authors and interested publishers. All CGH's authors should have received a letter from CGH by now. Any author who hasn't is asked to contact Richard at the usual address. (Send an SAE. If he was rich, he wouldn't be quitting.) His 'Dear Author' letter may be of interest to other would-be software writers, as well.

Richard is offering his well-ordered personal Public Domain collection of around 150 disks for sale at £200 inclusive. This covers effectively the whole library of PD programs offered by CGH. Richard also has a considerable amount of QL hardware and second-hand software for sale, including some microcassettes, and back issues of Quanta and QL World/QL User. Best offers secure. Please write or phone.

QL Technical Review and *QL Leisure Review* will continue to be edited and published by Bruce Nichols (see below).

It is not known for certain yet whether another agent will take over distribution of Simon Goodwin's DIY Toolkit software.

Richard sends everybody all the best and hopes we will meet again under some circumstance or another before too long. Contact him at Cwm Gwen Hall, Pencader, Dyfed, Cymru SA39 9HA. Tel. 0559 384574.

QL Technical Review issue 8 is now out. It is now edited by Bruce Nicholls, and all subscription enquiries should be addressed to him at 57 Shaftsbury Road, Romford, Essex RM1 2QL. The current issue costs £1.75 (includes UK postage; £2 into Europe, £3 rest of world) from CGH Services at Cwn Gwen Hall until 31 March 1993, when (unless we hear otherwise) we will assume that Bruce is taking over all sales and distribution of the Review. Bruce is also contactable via Tony Firshman's Bulletin Board.

The Review contains reviews of *Ftidy128*, the EEC Keyboard Interface, *Vision Mixer Plus*, *Remind-Me*, *DBeasy*, *Scriptwriter* and *Picturemaster Plus*, as well as articles on Mode changing and two sections on Super Toolkit 2. The Review hasn't benefited from the long gap since the last issue, as several of these programs have now been on the market for a year or more. The news sections are more up to date.

There is also a report of the International QL Meeting in Munster, March 1992.

Miracle on horizon

Miracle Systems are hoping to release their new PC-based QL card "soon", says Miracle's Stuart Honeyball. The board, a standard PC half-card, will be able to slot into standard IBM PCs and compatibles and "use" the host machine "simply as an I/O device" to run a new, advanced Qdos-compatible operating system, called QXL, now being developed by Qdos architect Tony Tebby.

In this way, Miracle hope to be able to colonise PCs and their users with the advantages of Qdos and 68000-series technology. The new system will be able to run "around eight times faster than the Gold Card", using the PC's own disk drives and hard disk.

The card itself will carry a Motorola 68EC040 processor, and is expected to have 8MB of ram. It will also have access to the QL's network ports so that users of both machines will be able to run mdv-based programs within the system.

Stuart sees the new development as a way of giving PC users access to 68000-based code, and to other advantages of the Qdos-based architecture. "We don't expect this product to be as big as the Gold Card." says Stuart. "We see it as the first of a series of related developments that will extend the whole range of the Qdos operating system. We are looking especially hard at the educational market."

He added that it is not Miracle's normal policy to feature developments before they are ready for the market, but that in the current recessionary climate: "You have to keep reminding people that you are still there and still developing."

OLD QL MAGS FROM QUBBE

Qubbesoft PD has a considerable stock of backissues of *QL World* and *QL User*, with a steady turnover. Send an SAE to them for a current list. Qubbesoft's catalogue issue 12 of public domain software is now out, with around 16 pages of software to choose from. Qubbesoft will be attended London and Glasgow All Formats fairs over the next couple of months (details are supplied with their catalogue) and can also be seen at the International QL Meeting in Eindhoven, Holland on 27 February, the Quanta AGM in Portsmouth on 24/25 April, and the Nottingham Quanta workshop on 28 March.

QL Scene

QUANTA AGM ON SOLENT

At last! A piece of information that we haven't been able to glean even from the pages of the Quanta magazine at time of writing: the dates and location of the 1993 Quanta Annual General Meeting.

The club AGM is being hosted by the Solent area sub-group during their April workshop, which is being run over two days: Saturday 24 April from 10am to 6pm, and Sunday 25 April from 10am to 5pm. The AGM itself, for Quanta members, will be on Sunday afternoon.

Trade stands, talks, a clinic desk, competitions and a bring-and-buy sale are planned. There will be tables and power points for attendees to set up their own systems, as well as car parking, refreshments and bar.

The location will be the Horizon Centre, Sundridge Close, Cosham, Portsmouth, near to the M27, A3 and ferry ports. For more information contact Jim Wilson, 14 Winchester St, Botley, Hants SO3 2EE. Tel. 0489 782540, Graham Goodwin tel. 0489 895451, or Graham Evans tel. 0703 403350. There is a sketch map of the location available. Our copy shows the Red Lion, Marriott Hotel, Post Office, Hilsea Lido, a hospital, and an object labelled "IBM" in the locality. No doubt when attendees are tired of relaxing, socialising, sending postcards and recovering, they can nip round and have a laugh at the opposition!

Open Channel

Open Channel is where you have the opportunity to voice your opinions in Sinclair QL World. Whether you want to ask for help with a technical problem, provide somebody with an answer, or just sound off about something which bothers you, write to: Open Channel, The Blue Barn, Tew Lane, Wotton, Woodstock, OX7 1HA.

QL ribbon

In the January *QL World*, under the heading Restocking, Martin Baxter requires information on ribbons for the QL printer. I am still using mine, and the replacement ribbon I use is the same as for the Amstrad 8256 and the Seikosha SP1600.

W K Larner
Liskeard
Cornwall

Trap

You published my letter about April's Systematic Machine Code in the September QL World. You included the program fragment I quoted, but the fifth line, which should have read:

```
trap #1 ;Do it
```

was misprinted. Dare I suggest that in future program fragments in Open Channel are simply photographically copied in separate boxes, as are listings in other parts of the magazine? This would eliminate problems arising from re-typesetting.

Ian Jackson
Smallburn
Northumberland

This is our normal policy. We want (and ask) to use the authors' original printouts wherever possible. However, in this case the code was embedded tightly in the letter. Some authors send us separate sheets, but if they are faint we have to retype them ... it isn't practical to correspond over a few lines of code. Sometimes we get it wrong (usually in Open ChanneL).

However, Ian's letter comes timely to remind me that Alan sent some revised listings in response to the original letter, and also revised the Keyrow routine. Copies of those two listings are available to anyone who sends an SAE to us.

So simple

Some time ago I saw the first letter in *QL World* from someone who uses, and is satisfied with, a QL with microdrives, Expanderam, *Lightning* and *Qram*, and who seemed to be pleading for more information about such simple systems. I would have written the same letter if I could have written to you at the time.

What annoys me most is not having had any improved version of Qram after I bought V1.07, although there were supposed to be later versions. When I enquired about this, I was told I could acquire Qpac, which needs disk drives.

I did try to get *Q-Top* on microcassette from TK Computerware, who sent me a disk, which I returned. I tried to alter the order when I learned that Q-Top required Toolkit to be used. None of the information I could find conveyed that it required Toolkit. Now I have seemingly lost £30.

I see no sense in increasing the power of my QL set when I have not yet found the time or inspiration to use more than a few parts of Qram in it. It was a year or more before I found that I could 'image' the contents of cartridges into the rams and reduce wear on the microdrives. It was many more years before I found how to use the printer buffer to reduce waiting times. The Qram instructions are unintelligible to anyone skilled only in ordinary English. It is only inspired guesses, and trial and error, which have enabled me to use what little I am using of Qram.

Also, the four Psion programs are adequate for my use. There is so much more to get out of *Archive* and *Easel*, and many things in *Abacus* and *Quill* that I have not yet tried to use.

Laurence Carpenter
Guernsey
Channel Islands

Early information and advertising on QTop did not make it clear that Toolkit was needed. This is occasionally a problem, and it is as well to make enquiries with the dealer when you are about to buy a larger program than you normally use, just to see if there are any extras needed. We have had other requests to print more articles on Quill, and will be doing so.

It's L out here

While in the process of typing out the Jupiter program in the January QL World, it occurred to me that the small letter 'l' and the figure 1 were almost indistinguishable from one another. In the case of the Jupiter oisting, once the sense of the program was appreciated, the problem resolved itself when looking at the terms "mylat" (line 30) and "twopiby10" (line 400), for instance.

As for the program itself, I found it most interesting, and it worked quite well, albeit a little on the slow side, especially then numits=300, taking 20 minutes to complete the picture. Lines 450 and 460 seem a little odd, with instructions to go to their own line numbers! I would welcome any comments from programmers on these.

J R Daniels
Solihull
West Midlands

The shady depths of the 1/l problem can be best illustrated by Mr. Daniels' writing out his examples as MYLAT and TWOPIBY10, so that I had no idea what he meant until I inspected our printed listing.

The Jupiter listing distinguishes between the figure 1, with a long upturned serif, and letter l, with a shorter serif, but you certainly have to locate examples of each, and maintain a suspicious attitude thereafter, to be sure of choosing the right 'one'. I had one letter recently, printed on a very high-quality laser printer, in which the figure and letter were identical. This was a problem on some old typewriters, but we expect better design from computer printers.

Spectrum

I hope you don't mind me bringing up my ZX Spectrum. I read with interest Carlo Delhez' review of his ZX emulators.

The keyboard membrane of my Spectrum (48K) no longer functions properly. It seems impossible to find a replacement membrane in Belgium, but I would appreciate any help in locating a replacement in the UK.

Rudi Stouffs
Pittsburgh USA
and
Overijse, Belgium

A Spectrum user advises us that: WAVE, 1 Buccleuch Street, Barrow in Furness, Cumbria LA14 1SR, sell Spectrum membranes at reasonable prices. Write to them for information.

Tut

It was really a surprise to find my letter in *Open Channel* in the November issue, but I must apologize for a typing error in the startproc for TABLES which happened when I used *Quill* to insert it. *Archive* does not accept double quotes " " within double quotes, so for safety's sake I enclose a revised version. For TABLE the startproc should read:

```
---------

proc start
cls
print at 3,10; "Insert data disk"
print at 4,10;
"command:TABLE(LIST),'filename',
'logname'"
print at 5,19; "'option','extraline'"
print at 6,10; "(multiline or
single line output)"
print at 7,10; "ask directory for
exact filename"
print at 8,10; "if no other open
files enter [*] for log$"
```

print at 9,10; "if Opt$=[''], output will be to printer"
print at 10,15; "other options: 'screen' or 'file'"
print at 11,10; "TABLE needs any parameter if extraline required"
print at 12,19; "[' '] gives blank line, [ ] gives no extra line"
print at 14,20; "NOW TYPE YOUR COMMAND"
endproc

I was glad to find the missing line on Robin's listing in QL Scene, though the program still forces a new page after some lines, so the problem must be elsewhere.

Albert van Rheenan
Amsterdam

Lock-ups

I am happy with the QL, and continue to make improvements when I can. As a necessity, for a variety of reasons, I shall be getting a 386 or 486 PC sometime this year (hopefully). What a bewildering variety there is! But this is not a break in faith with the QL - I shall be getting a Goldstar monitor soon, and going to the All Formats Fair in Hammersmith in February, a first visit and one I have made time for, not easy!

I have been encountering the - probably old - problem of the QL freeze-up, sometimes without any prompting, sometimes when using the ^ (little hat) cursor. What is the source of the problem? I recall reading about a better PSU from, I believe, Dennis Briggs. Does it work? Is it still available? Or is the QL overheating. Would a PC-style fan help or confound?

My wordprocessor at work has a number of features that Quill lacks, like regular automatic save, and a spell-checker that leaves anything I have seen for the QL standing. I am awaiting the Goldstar before I can see what I am writing with the *text87* and *Perfection* packages - I hope Fred Toussi will allow me to upgrade to Plus4 when I can afford it! However, what I really want is option to ignore; replace (with a suggestion from the Thesaurus or myself if I want), add to the dictionary, spellcheck existing files, and not to have to re-institute Spellbound after each cursor move. Is this too much for big programmers, I wonder?

I like *Quill*, now Turboed in V2.35. Are there more enhancements? It is easy to use, friendly and does have some shortcomings in the way of fonts, sizes, mixes and the like, but I am still near the netry level in computing and restricted in time, so it has been great to have at my elbow. I just wish it would not freeze ... and it would be great to use a few accents, UDGs and whatever.

I've a haste of other queries, but enough for now. Questions are easy I hope for a few answers!

L Ross
Reading
Berks

Lock-ups have been endemic in early QLs, and overheating of certain parts is a favourite explanation. You should talk to Tony Firshman (071 724 9053) or Dennis Briggs (0952 255895). Fitting an external fan is a high-tech move that doesn't really address the problem, which is often under-rated components. But it doesn't hurt to let air circulate round the machine and not lodge too close to a radiator or similar.

Spellcheckers is one area where the QL is still behind the PC market, despite the speed, size and sophistication of the Perfection Spellchecker and Dictionaries. The kind of checker where you can take any document, run straight through it, and replace at a keystroke the chosen word either with the Spellchecker's suggestion, a Thesaurus suggestion, or your own choice, update the dictionaries on the spot, or ignore any suggestion, all at operating speed, have not reached us yet. It took a long time for them to reach the PC. They are large and very sophisticated programs, and the ones I have tried still have shortcomings, including slow operation.

If you are not in a hurry, a dictionary and a bit of paranoia does the best job. The Spellchecker has not been invented that can catch the classic 'not-for-now' error, and nor do grammar checkers. Quite often, specialist information is the only way of catching that type of misprint.

Fan mail

Back in August 1992 I took the step of writing to the venerable Simon Goodwin c/o Arcwind Ltd., following his article on Spectrum emulators. The subject of my letter was an "EXPERT" program, the listing of which was published some nine years ago for the Spectrum, and on which I had spent some considerable time trying to translate into SuperBasic without success.

I enclosed the Spectrum listing and asked Simon various questions about the feasibility of emulating this. Months went by and I had given up hope ... well, almost! When, the week before Christmas I had a call from Simon apologising for the delay and saying that he had only just received my letter, with a covering note and apologies from Arcwind saying that following upheavals at the office the letter had only just come to light. He had been able to analyse my listing and gave me the answer to my problem there and then. Ten minutes' work on the program and a little tidying and the program is up and running on the QL.

Thank you, *QL World*, and thank you Simon Goodwin, help is what makes the jolly old world go round. Happy New Year to all and sundry. Thanks for a great magazine.

R D Hardie
Great Yarmouth
Norfolk

It's a beautiful world, isn't it? It's also amazing what comes to light when we move the furniture. Please note - QL World contributors are not required to answer any reader mail except that relating to errors or omissions in their own columns. This is to prevent working people being swamped with Help! letters. However, they will try to help if they have specific experience of a problem someone is stuck on. Bear in mind that a writer is a supplier like any other: not there to do unpaid research, but happy to share knowledge that they have.

Little Sam Coupe

It may seem like a backwards step to extend coverage to an 8-bit computer like the Sam Coupe, but this machine has sold several thousand, and users are sorely in need of a glossy magazine now.

Editor's notebook

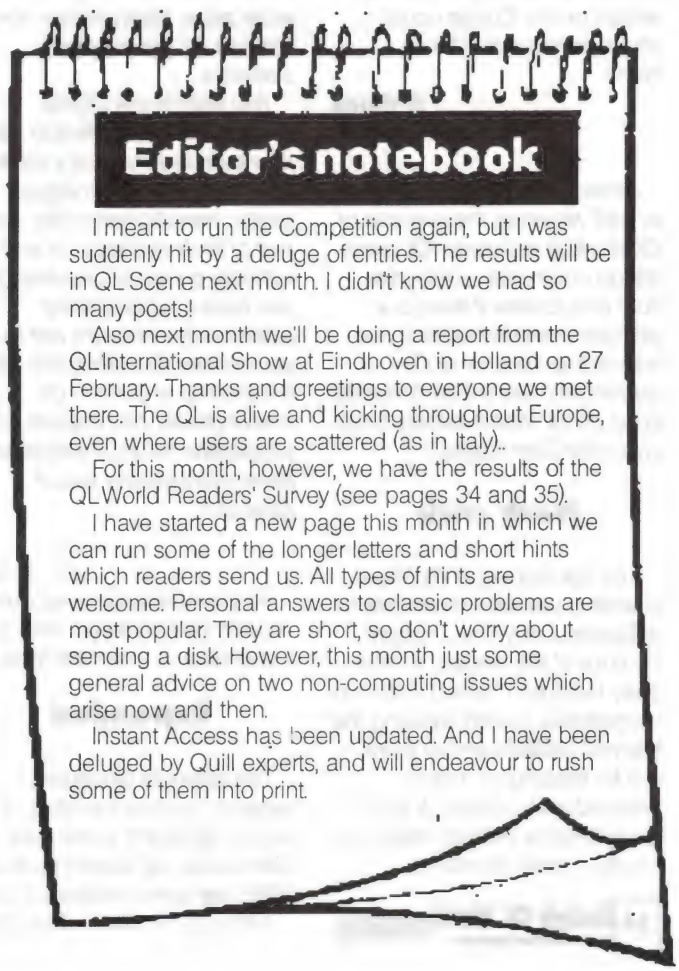
I meant to run the Competition again, but I was suddenly hit by a deluge of entries. The results will be in QL Scene next month. I didn't know we had so many poets!

Also next month we'll be doing a report from the QL International Show at Eindhoven in Holland on 27 February. Thanks and greetings to everyone we met there. The QL is alive and kicking throughout Europe, even where users are scattered (as in Italy)..

For this month, however, we have the results of the QL World Readers' Survey (see pages 34 and 35).

I have started a new page this month in which we can run some of the longer letters and short hints which readers send us. All types of hints are welcome. Personal answers to classic problems are most popular. They are short, so don't worry about sending a disk. However, this month just some general advice on two non-computing issues which arise now and then.

Instant Access has been updated. And I have been deluged by Quill experts, and will endeavour to rush some of them into print.



The Coupe is a very modern computer which would ake a good partner for the QL It continues the Sinclair tradition of being both an accomplished machine and a splendid computer for the hobbyist.

Its memory can be extended to 4MB (all available to Basic). It has a built-in drive, an excellent DOS and a friendly and advanced Basic which can be improved further by adding MasterDos and MasterBasic. It is well suited to applications like databases, spreadsheets, graphics and sound.

It also possesses a Spectrum emulation mode, which, with the aid of the programs Specmaker or Sma Tape 4 gives almost complete compatibility with Spectrum software, but in Coupe mode it goes far beyond the Spectrum.

After a slow start, there is now quite a lot of software for the Coupe. Coupe owners have a similar age range to QL owners, and many have an interest in computing, as such, rather than games.

Despite recent problems, the computer and all its peripherals are still being manufactuered and sold. There are sufficient users to ensure that the scene remains active for years. Some articles on the Coupe could attract more readers for QL World.

R Bates
Nottingham

Simon Goodwin is a Sam fan as well. However, the purpose of QL World is to interest QL users. We do cover other computers from time to time if there is a genuine common interest (for instance, quite a lot of QL owners also use a Z88 portable). What do QL World readers think about the Sam Coupe?

Neck crick

You ask readers of QL World to write to you with comments or difficulties. Every time I receive my copy of the magazine I feel guilty because I haven't written to congratulate you on surviving the Maxwell debacle and to thank you for keeping QL users informed and in touch. A lot of the material is over my head, but it is still a great source of enouragement. Thank you.

One difficulty that I have is a crick in the neck from trying to read the new nose-down headlines. I cannot see what is modern about irritating your readers. Please think again. Apart from that the layout is excellent.

But my gripe led me to think about how to get a landscape-format printout from my QL. I use a Brother typewriter as a printer, but it is pitifully slow and restricted, being a daisywheel. I want to buy a new printer at the cheaper end of the market, and as I use Abacus a lot, I wonder if there is any way of getting that, and Perfection, to swing things round by 90 degrees. Do you have any suggestions.

RS Matthews
High Wycombe
Bucks

So much for style! But we are taking note.

The simple way to print 'landscape' is to adapt your own method of swinging the paper round manually. Format your page with a shorter depth and longer lines, and then sheet-feed your printer with paper turned landscape to get the wider page. Most printers now will take A4 paper turned sideways.

You should ask Digital Precision about Perfection - they may even recommend a printer. Likewise, most of the bigger printer manufacturers offer some sort of technical support and will help on the phone even if you have a second-hand machine (provided it's not too out-of-date). But otherwise you are looking at custom QL printer-drivers. Has anyone got a suggestion for a printer/printer-driver combination to suit Abacus?

I'm really surprised that readers can't read sideways and upside-down. Obviously they're not as nosy as me!

Expanded

The example procedure, 'expand', to show the effect of MOVE_MEMORY in the *New User Guide, QL World* November 1992, has some mistakes. In line 120 and 130 the multiply sign * after screen address 131072 should be a plus +. Secondly, to produce 256 lines (the upper part of the screen) to twice its height you must change line 110 to FOR x=127 TO 0 STEP -1, and add "+ 128" to line 130. If you only correct lines 120/130 with the "+" sign, you will only affect the upper lines 1 to 127 and line 0 and 255 of the whole display on the monitor are unchanged. That finally means that only line 1 to 127 are doubted, and are displayed from line 1 to 254. If you don't believe me, try it out.

The procedure 'expand' is then:

```
100 DEFine PROCedure
expand
110 FOR x=127 TO 0 STEP -1
120 source=131072+x*128
130 target=131072+x*256+128
140 MOVE_MEMORY
128,source TO target
150 MOVE_MEMORY
128,source TO target-128
160 END FOR x
170 END DEFine expand
```

That's all, friends! Bye!

Dr. G. Gellissen
Monheim 1

Miraculous

I had a small problem with my Miracle ED drive, so I wrote to Stuart Honeyball for advice. Unfortunately, to look at my drives I would have to send them and the Gold Card back to Miracle and, as I live in Ibiza, this would have been tricky. Post is impossible, taking anything from 6 days to 6 weeks, finishing up in Customs in Palma or Barcelona and needing a Customs Agent (at one's own expense) to sort it all out (sometimes the package is returned to England in the meantime).

So I asked if I could bring my hardware in the next time I visited England (as I could still use my rig). On a visit in October I asked my daughter to phone Miracle to arrange an appointment. They gave me detailed directions, and I was made very welcome and given to Mike Tomlinson, an experienced technician who put the ED drive and Gold Card through tests. A small change was made in my Gold Card (which may not have been necessary, but Mr. Tomlinson did not want to leave anything to chance) and the ED drive needed to be dismantled, so a new one was produced and checked with the Gold Card, and all was perfect. Within an hour of arriving at York station I was back at the station, Service, without any doubt, of the finest that anyone could look for.

Anthony P Magnus
Ibiza
Spain

WHOOPS

With reference to the letter about PC Conqueror and Wordstar in the February Open Channel, the letter was sent to us on 27th December - the same letter was sent to Digital Precision on the same day, and no previous letter or telephone message had been received by Digital Precision.

Digital Precision posted their response on 29th December with a certificate of posting - within 24 hours of receiving the letter. Mr. Gataaura's problems were due to his failure to set the correct baud rate, although this is clearly described as the first thing to do if you have printing problems, in the Conqueror manual. Mr. Gataaura had not bought his DOS from DP; if he had, he would have benefited from DP's presetting of the baud rate on DOSs bought from them.

When mentioning "saving", he meant "sending the file to a printer", as it turned out. His problem with Xover was due to using EXEC and failing to engage Ctrl-C. The manual recommends use of EXEC_W, which is automatic!

Please take my point! If trying to contact a supplier with an answering machine, please leave a message! We know DP publishes Professional Astrologer, but they don't claim to be able to read minds! And please give dealers time to respond before you ask QL World or Quanta for help - we had no idea his letter was sent to us and DP on the same day!

If you do ask us for help - please let us know when someone has helped you - especially when they help you as quickly as this! Thank you, Digital Precision!

QL Scene

ALL FORMATS DIARY

Coming dates for the All Formats Computer Fair are:

20 London Sandown Park Mar 21 West Midlands National Motorcycle Mar 27 North West Haydock Park Racecourse, junction 23 M6 Motorway 3 Apr Edinburgh Appleton Tower, George Square 4 Apr Glasgow City Hall, Candleriggs, Glasgow Apr Nottingham University, Jesse Boot Centre Apr 18 West Midland National Motorcycle Museum, junction 6 M42 Apr 24 London Hammersmith Novotel (NOT Sandown Park) Apr 25 Bristol Brunel Centre, Templemeads Station May 1 Northumbria Centre, Washington, Dist. 12 May 22 London Sandown Park, Esher, Surrey May 29 Leicester, De Montfort Hall, Granville Road.

Check with any particular supplier whether they will be at a particular Fair. If you have far to travel phone All Formats 0608 663820 to check arrangements haven't changed. Many QL suppliers only attend the Glasgow and London fairs. In London the Hammersmith venue is preferred.

Day tickets are £4, but attendees can get up to 50 £1-off vouchers if they send an SAE to the organisers at: Maple Leaf, Stretton-on-Fosse, Moreton-in March, Gloucestershire GL56 9QX. (Only one voucher can be used per ticket, of course.) However, admission to the Fairs will be a flat £2 between 2pm and 4pm in future (£1-off vouchers do not apply at these times).

NEWS FROM VALHALLA?

Former Thor International owner Hellmuth O Stuven has written to *QL World* to confirm what many Thor and QL owners believed, that Thor International no longer exists, at least in any form that is supporting international Thor users.

The Thor advanced QL was developed initially by British company CST, and later by members of that company together with Stuven's company QSoft, which had worked on development of the Danish QL in 1985. Stuven's QL business in Denmark was familiar to QL users under the name Dansoft in the late 1980s. Under the flag of Thor International, Stuven hoped and planned to institute mass production of Thors in Denmark using the production lines of well-known toolmakers Bruel and Kjaer.

A further, important plan was to establish a market in the then Soviet Union, which was hungry for computer resources, and large-scale production there. However, investment projected for that end failed to come to fruition as the investors apparently lost faith in the market.

Thor International were left to market their advanced News System designed around the modem-based on-line news-gathering system of Danish news agency Rizaus Bureau.

Stuven left the company in 1990, believing that there was no likelihood of further expansion without the necessary investment.

Users in Europe and the UK were already reporting that support for the Thor through the Danish company was becoming patchy. Shortly afterwards it appeared to dry up altogether.

Helmuth Stuven's letter implies that software bundled with the Thor can now be regarded as public domain. More information follows. Mr. Stuven sends his best wishes for the future to all QL and Thor users. The best sources of support for the Thor are now thought to be Quanta in the UK, Malcolm Smith of the Thor User Group in Norway, and Cowo Electronics in Switzerland.

Byline mixup

Apologies to reviewers Nigel Bates and David McCullagh. Nigel's review of Developing Applications on the Sinclair QL appeared in the January issue of *QL World*, after spending some time lost in the wasteland of a subdirectory system, under David's byline.

London South East Group

The London SE Quanta group was set up in November 1992 as has had an active meetings schedule since. They meet monthly at The Green Room, Emmanuel Church Hall, Hadlow Road (corner of Granville Road), Sidcup, from 7am to 11 pm. The venue is about a quarter of an hour by foot from Sidcup station and close to the M20(A20)/M25 intersection, with parking. More information can be had from the Group Chairman, Joe Haftke (081 302 6154) or Secretary Roy Barber (081 304 3856).

NEW AMIGA QDOS RELEASED

From Simon Goodwin.

Version 3.20 of Qdos for the Commodore Amiga is now available from QL public domain suppliers, compatible with 68020, 68030 and 68040 processors as well as the original Amigas' 68000. The emulator is an accurate copy of JS Qdos, changed only where necessary to support the Amiga hardware. Separate pseudo-rom files support two Mode4 screens, UK and German keyboards, plus extra devices like FLP, PAR and SER, successfully tested with Hermes at up to 19200 baud.

The main disk includes documentation, QLDIR and QLFORMAT utilities, and a public domain 68000 macro-assembler. If you boot from the emulator disk the Amiga can read or write QL and PC files as if they were on Amigados disks. You can even put '.info' files on QL disks that appear as icons on the Amiga desktop, allowing files to be copied or viewed, thanks to the efforts of Manchester's Francis Swift.

Complete source for the emulator and a public domain Toolkit comes on a second Amigados disk. The Toolkit has been written by Mark J Swift and adds many Toolkit 2 commands as well as Amiga extras.

The third disk is in QL format and contains all the files from the original PD release plus Amiga icons and extras. Simon N Goodwin has added a 4096 colour palette editor written in SuperBasic, and a short code demo that shows how to use the Blitter hardware from Qdos.

The Qdos emulator runs in Mode4, showing Mode8 screens with stipples and an altered palette. The rate of screen update may be set with the SCR_PRIORITY command, to a maximum of 25 per second. A 1MB Amiga 600 offers about 880K for Qdos; the new £430 32-bit Amiga 1200 gives 1920K, or more with internal expansion, and runs QL programs at up to eight times the speed of an expanded QL.

Up to four FLP drives are supported, as well as PC floppy and hard drives via the JAN device and hardware PC emulator, but you cannot access Amigados hard drives once Qdos has started. The floppy driver is fully QL compatible, much faster and more reliable than earlier versions. A public domain static ram driver comes on the support disk.

The SuperBasic interpreter is adjustable to show six, seven or eight significant digits, so 24 bit addresses can easily be entered and edited. Current 16 bit Amiga hardware allows up to 10MB of ram.

There are a few snags besides the limited Mode8 colour: BEEP has no effect, and the Amiga cannot emulate the TAS instructions in some QL programs (notably Toolkit 2, Qlib, Turbo and Supercharge tasks) so these must be replaced before such programs will run correctly. TAS_REPLACER_BAS has itself been replaced with fast new tasks for 68000 and later processors, and a utility to fix Qliberator tasks so that they suit both QL and Amiga. The new TAS emulation does not conflict with existing co-processors.

PC CONQUEROR

Gold Special Edition

Programmer Mark Knight runs Digital Precision's newest PC emulator.

PC Conqueror Gold Special Edition is the latest and best PC emulator for the QL. It is not just a modification to the old PC Conqueror, but is a different program altogether. The new program is intended to take advantage of the best new QL hardware add-ons, and improves greatly on previous emulators. PC emulators give QL users access to software compatible with the IBM PC and its descendants. A mouth-watering amount of this is in the public domain and shareware. There is more software for the PC than for all other small computers put together. Providing QL users with access to this is one aim of Digital Precision's PC Conqueror Gold SE.

I had used the standard PC Conqueror (the predecessor to Gold Special Edition) for three years, and never had any hassles with it other than through errors of my own programming. On my old QL system (which had an Expanderam 512K, CST interface and fast 3.5in 720K drive) before the arrival of Gold card, the speed of the old program was sometimes an irritant when running more demanding software. One program that was too slow was a game with supposedly fast-moving graphics. I was mainly using the old Conqueror for editing and compiling, and for these it was adequate. But of course I would have loved it to go faster. I was very interested to find how much the Gold Special Edition had improved in speed and other ways.

PC-free

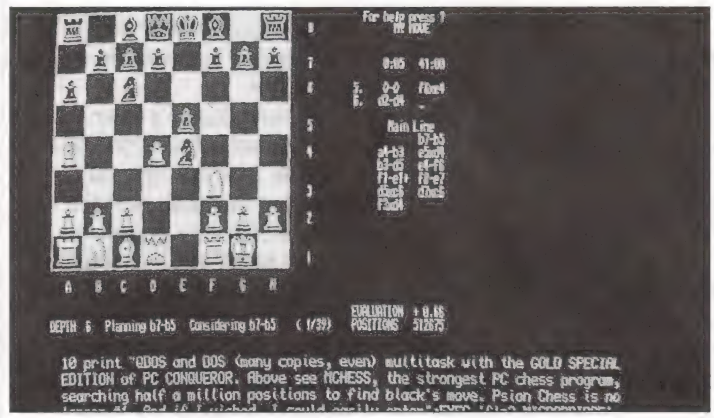
The main advantage of Conqueror Gold SE is that you don't need to buy a PC to run PC software - a considerable saving in desk space and cash. You could even run QL software at the same time on the same machine: as Digital Precision are fond of pointing out, your QL is still a QL, and can still multitask. PC Conqueror Gold SE is entirely software, so no hardware changes are made to your QL system.

There are two other advantages to using an emulator. Some types of diagnostic work are easier to perform in a Gold SE environment than they are in a "real" system: a crash in the PC program can almost always be escaped-from without resetting the QL, even when a real PC would have locked up completely. This permits both examination of memory and rapid reboot.

Not often quoted, but of some importance to users of public domain software, is the ability to check a program in an environment where PC viruses and Trojans cannot do lasting damage. Many of the unpleasant tricks used by viruses would be trapped by PC Conqueror Gold SE and reported to the user with an offer to abort the offending program.

Main features

Digital Precision state that PC Conqueror Gold Special Edition is much more compatible than all previous emulators. This is borne out by the large number of software titles that will run with the new emulator: almost everything runs, and if something doesn't run it will probably be because it uses a screen mode that the current QL hardware cannot support. The most common CGA graphics modes are all supported, including 640 x 200. This is theoretically beyond the capabilities of the QL, but an intelligent shrink routine manages it without cutting off the side of the screen, and without any excessive speed penalty. Gold Special Edition's screen handling is impressive all round. As it was used with the Gold Card for the purposes of this review, part of the credit must go to the Gold Card, and part to the program's intelligent screen update routine, which only makes changes when and where they are needed.

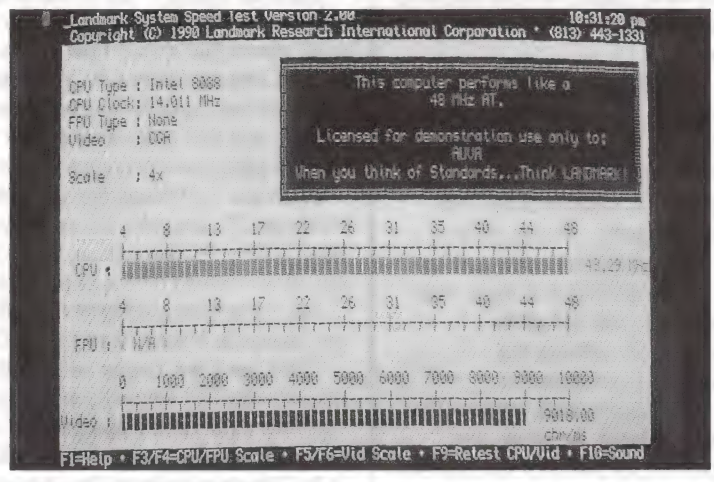


PC Conqueror running USA MChess.

Should higher resolution screen modes become available on the QL, Digital Precision have already built hooks into the program which will make further PC graphics modes easy to add.

Only one awkward program wouldn't run under PC Conqueror Gold SE, but the offending package wouldn't run on some PCs either!

Needs ram



A Landkark benchmark screen.

The new support for PC-expanded memory greatly widens the range of software that can be used, and this is one of many improvements that Digital Precision could only make since the Gold Card and other large ram systems (some Thors, the Amiga QL emulator and various Atari ST QL emulators). Conqueror Gold SE needs 1.2 MB of memory or more in order to work.

One of the biggest improvements in the Gold SE is the new range of disk drives supported, including the latest Miracle ED drives. Previous QL PC emulators were written when the biggest floppy capacity for the QL was 720K, so only this and the smaller 360K, 320K, 180K and 160K standards were supported. Conqueror Gold SE supports the PC high-density 1.44MB format (if you have an appropriate HD or ED drive), and will fool PC programs into thinking that they are accessing a hard disk on the new Miracle 3.2MB disks, or any other QL storage device. As this "hard disk" is a QL file, you have a very easy, quick and reliable hard disk backup system - just copy the file to another ED disk using the QL COPY or WCOPY commands.

The requirement for bigger memory is partly due to the new support given by PC Conqueror Gold SE for the PC expanded memory standard, which can also allow programs that need extended memory to work. Expanded and extended memory are not the same thing on a PC - you really don't want to know the details!

While on the subject of memory, I was pleased to note that 671K of conventional and upper memory was left free for PC programs. An advert for a well known PC memory manager (costing £93.94) was boasting about leaving a mere 618K free!

Management

Digital Precision do not seem to make one thing clear enough in the manual: that it is not only unnecessary to run third-party memory management software within PC Conqueror Gold SE, but downright counterproductive. The built-in memory management in Conqueror Gold SE is superior, and is completely automatic. All other PC memory management software that I have seen is far from automatic, demanding much tweaking and experimentation, often to little effect.

A major improvement given by Gold SE, available only on some systems, is the use of the faster of the two clock rates on the Gold Card. It is not well known that the Gold Card is capable of being switched from the normal 16MHz clock rate to 24MHz. On some QL and Gold Card combinations this can result in a lockup or corruption, so Miracle do not encourage the practice. If you have a QL system that can cope (Conqueror Gold SE will tell you immediately if yours will), this feature provides a serious (over 40%) boost to speed. If you do not have such a system, consider getting a QL that will work at the faster rate with your Gold Card (W.N.Richardson & Co, formerly EEC Ltd., are a good source of QLs). I used a system which ran at the fast rate and it operated totally reliably throughout all my work.

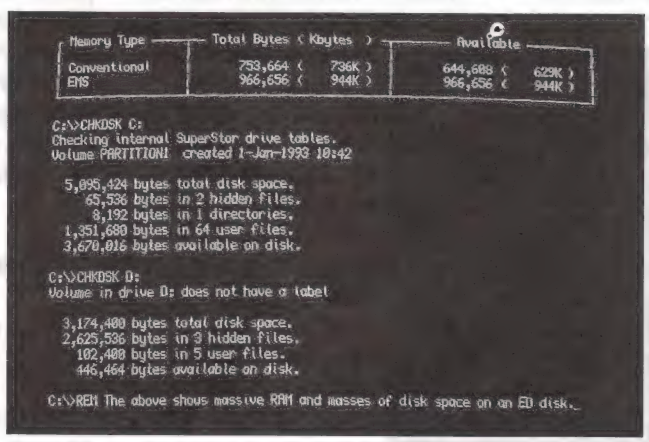
While information on a POKE to set the higher speed on Gold Card has been doing the rounds, Digital Precision have chosen a much safer and more intelligent method of increasing Conqueror Gold SE's speed. They have made it automatically switch to the lower rate during most I/O operations. Since the speed of such operations isn't limited by processor speed, there is no point running the system faster, and the switch to the lower speed means that the system runs cooler, and therefore more reliably.

Forward

PC Conqueror Gold SE also contains many new techniques, again making use of the extra QL memory. These techniques include "pseudo compiling", where commonly used combinations of machine code instructions are detected and emulated in one step.

One superb feature that I discovered shows forward thinking: many of the routines within Conqueror Gold SE were written to fit in the on-chip caches of 68030, 68040 and 68060 processors. This will take real advantage when Miracle Systems give us some of their planned future products. Highly linear code in some sections, avoiding many subroutine calls, also speeds things up by avoiding processor branch and call instructions causing cache and pipeline flushing.

Obviously even Digital Precision cannot predict exactly how much effect this will have on program speed. It is likely to be very significant (well over ten times faster than Gold Card even for the slower clocked 68040s). Some of you can benefit from this cache effect already, using the 68030-based Atari QL Emulator from Jochen Merz.



More data can be fitted onto a Miracle ED disk even than Miracle claim!

Other features

When users with more than one QL system purchase PC Conqueror Gold SE, they may also wish to run the software on the second QL with between 512K and 1.2MB of ram. The standard PC Conqueror will run on such systems, and it is shipped on the Gold Special Edition disk at no extra cost.

Configuration routines are also present to change the screen colours used by a program, even if the program itself doesn't have this facility. This can make the difference between a screen that is difficult to read, and one that is clear and comfortable in use.

The auto disk-sensing mechanism is also new and welcome, and provides your QL PC with a feature not present in other PCs. You can use an ED or HD disk drive and the system will automatically detect any disk format from 160K to 1.44MB disk, and read and write the disk without problems. A PC system usually has to be told what the disk type is. To keep things as quick as possible, you can select which disk format your QL/PC should expect, and that will be the one automatically checked first.

DR-DOS 6

Optionally supplied with PC Conqueror is the latest version of DR-DOS, an excellent alternative operating system to the Microsoft MS-DOS which was written for the PC. DR-DOS comes from Digital Research, and is regarded by many competent PC users as superior to MS-DOS in their current versions. DR-DOS is designed to run MS-DOS programs, but I have found it to be more widely compatible, with more features, commands and options, and it includes the ability to compress files as they are being saved to a floppy or hard disk. I'll expand on this.

This compression is automatic if you have opted for it, and files are automatically decompressed as they are

loaded. The speeds of compression and decompression are such that the user is unlikely to notice that they are taking place. One reason for this is that the file is smaller and so takes less time to write to or read from the disk. This offsets the time taken for compression and decompression, which is thus transparent to the user.

Compression can be as little as 1.2:1 for very compression-resistant files, such as some handwritten machine code PC programs (rare - virtually everything executable is compiled) and as much as 16:1 on text files. A doubling of available memory space is typical. (The editor also knows of PC users who have had similar results.)

Compression

Digital Precision showed me a 3.2MB ED floppy disk, on a new Miracle ED drive, which contained 8.2MB of assorted PC files from a hard disk! I was able to check this disk with diagnostic PC software that I am familiar with, and it was absolutely convinced that this was a PC hard disk containing the stated amount of data.

DR-DOS is also supplied with a disk optimiser, and various wildcarded file-handling functions which can sort on a number of criteria. There are many more advantages to DR-DOS - too many to list here - but I have seen enough of both systems to convince me, and so have many PC magazine reviewers.

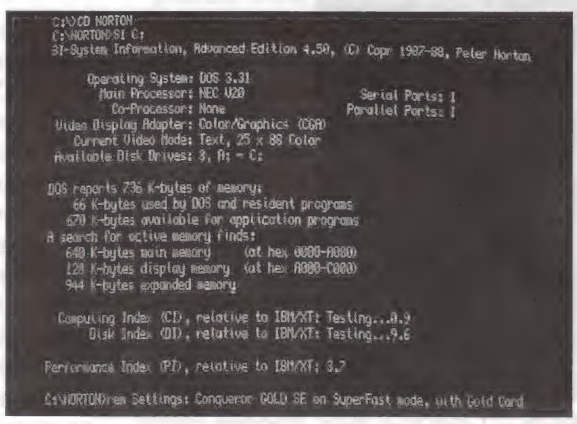
If you already have a DOS, the bottom line is that if you want compression and extra features, get DR-DOS 6. On speed alone, there is little to choose: indeed, MS-DOS 3.3 and DR-DOS 3.41 may win by a whisker, as they are more compact.

Each DR-DOS supplied by Digital Precision is accompanied by a preconfigured, free ready to run boot-up DD DOS disk, to save users from having to set up DOS. For an extra £10, Digital Precision will also supply (to registered DR-DOS 6 users only) a bootable pseudo hard disk (ED) with DOS and some demo software preloaded: you can ask for a "straight" or a compressed disk (for £18 you get both). These give a phenomenally fast boot-up.

Benchmarks

Benchmark programs have their limitations: they test what they were specifically designed to test. The most representative benchmarks are the actual programs you are likely to want to use.

The old standard PC Conqueror was exhaustively benchmarked by another reviewer in the May 1990 QL World. I agree with his findings, which can be summarised as follows: the old program had a very high level of compatibility with MS-DOS software, was adequately fast, running at about half the speed of a standard (4.77MHz) PC/XT, and was highly recommended. As that program now costs £30 less than when the review was written, it must now be a bargain.



Testing Conqueror under Norton.

Each DR-DOS supplied by Digital Precision is accompanied by a preconfigured, free ready to run boot-up DD DOS disk, to save users from having to set up DOS. For an extra £10, Digital Precision will also supply (to registered DR-DOS 6 users only) a bootable pseudo hard disk (ED) with DOS and some demo software preloaded: you can ask for a "straight" or a compressed disk (for £18 you get both). These give a phenomenally fast boot-up.

On features alone, I have seen that the new PC Conqueror Gold Special Edition is well ahead of its predecessor. The questions to be tested by benchmarking is whether it is improved enough to justify the £40 premium over the standard Conqueror, and whether it is fast enough and compatible enough to be used in place of a modern PC for demanding PC applications.

I have access to an extremely fast PC equipped with a 66MHz 80486DX2 Intel microprocessor - the fastest PC processor money can buy. It was running on a machine equipped with lots of ram, cached static rams and fast (13ms average access time) cached hard disks. This state of the art system was used for many comparisons with PC Conqueror Gold Special Edition.

Lightning Special Edition was used for all QL tests, as I use it for all my QL work. I would recommended that all QL owners use Lightning SE, as it provides very significant benefits. The version of it for Gold Card is £10 cheaper, too.

Norton

Norton Utilities 4.5 Speed Index revealed that my old QL system running standard Conqueror was bested by the Special Edition by a factor of eight! Just over half of this is due to the hardware, the rest to improvements in the emulator.

Even better, the Norton Disk Index for the ED drive used with Conqueror Gold SE was 9.6: this is a superb result as the cached hard drives on the 80486 PC returned 7.6 and 9.2, actually slower. The QL result is thanks to fast ED drives, excellent Qdos built-in cache routines (don't waste space with DOS caches with Conqueror Gold SE - it uses better Qdos caching automatically), Gold Card's speed and, of course, Conqueror Gold SE's abilities. The disk benchmark clearly reflects observed performance, as the boot-up test and the Sage program subsequently showed. The overall Norton Performance Index for the Conqueror Gold SE is 3.7, a vast improvement over its predecessor.

The Landmark 2 benchmark was also favourable, giving more resolution (more digits) than Norton's, and revealing that the speed of the Conqueror Gold SE/Gold Card combination lay somewhere between just under a basic PC/AT at worst to just over twice the speed of an 8MHz PC/AT. Note that a PC/AT is between three and five times faster than a PC/XT.

The Landmark results varied with, and could be "tuned" by, changing Conqueror Gold SE's job priority settings, an operation explained in the manual. Giving the emulator very low job priorities gives jerky screen-handling (Conqueror Gold SE is normally smooth) but faster stopwatched timings.

In conclusion, benchmarks suggest Conqueror Gold Special Edition is about three or four times the speed of a PC/XT in processing. Hard disk handling on Gold Special Edition scores even better and can outperform some real hard disks.

When 20MHz 68040 QL systems become available - soon, I understand I expect results from PC Conqueror Gold SE (other than disk results) to improve by about fifteen times over Gold Card's performance, which would make the system faster than the vast majority of modern PCs, even including 386DXs. An exciting prospect, as the resulting emulated PC will be able to do things no real PC can.

Program tests

These measure how the program performs in the real world.

To boot up Conqueror Gold SE on Gold Card from ED disk (either compressed or not) with a minimal AUTOEXEC.BAT and CONFIG.SYS takes under seven seconds. To boot up its predecessor on my old QL system took 90 seconds. On the 80486 PC it took over thirty seconds to boot from a standard 720K floppy with identical system files: booting from the hard disk was only a

second or so faster than Conqueror Gold SE. This is an amazingly good result for Conqueror Gold SE: Digital Precision's advertisement for PC Conqueror Gold SE in the September 1992 *QL World* claims a five-times speedup in disk handling (ED over DD), but it is actually at least six times faster!

I ran *Diskopt,* the disk optimiser bundled with DR-DOS 6, and found it very quick at scanning and optimising. Sorting files was very rapid. PKArc, the famous shareware file archiving utility, was outstandingly fast running under the emulator: it would have been usable at even a quarter of the speed. It was faster than the QL port of the same program running on the same Gold Card. The word processor NewWord was also impressive: non-Windows word-processors, spreadsheets and databases should all run at perfectly acceptable speeds.

Turbo Pascal compiled and ran programs fast: my only complaint was that the pop-up menus could have popped quicker. The emulated Quickbasic interpreter runs only about four times slower than native SuperBasic, which is better than expected. Compiled Quickbasic runs a great deal faster, outpacing SuperBasic by five to ten times.

I tried *MChess,* an American PC chess program. For the first time on the QL, there is a chess program stronger than Psion Chess. The playing strength of a chess program is related to how fast it "thinks", so the faster the hardware, the better it plays. A position solved by Psion Chess on my old system in 17 seconds and on Gold Card in just over four seconds was cracked by Mchess running on the emulator in under three seconds. The combination of Conqueror Gold Special Edition, Gold Card and Mchess, achieving search speeds of thousands of positions per minute, comfortably vanquished Psion chess on Gold Card.

Mchess was completely usable even though it runs in graphics mode, Conqueror's slowest screen mode. Mchess has far more features than Psion Chess, lacking only a 3D view. It was impressive that Mchess ran at all, as it has a very hardware-dependent copy protection and is choosy about the PCs it runs on and hard to back up.

Running SAGE accounts, the leading UK business finance program, in a demo mode at its maximum speed produced a startling result: Conqueror Gold Special Edition was so fast that text messages, pop-up windows, displays and block graphics flashed by so rapidly that is was impossible to read them! Of course, I could have run SAGE at a sensible speed, but I wanted to see just how fast the new Conqueror could go. This test must be unrepresentative, as otherwise Gold SE would be at 386DX speed. In any event, PC Conqueror Gold SE is much too fast on at least one application!

Conclusion

PC Conqueror Gold Special Edition is an excellent product, accompanied, as so often with Digital Precision software, by a comprehensive and informative manual. The program does a difficult job, and does it well, without any more effort on the part of the user than would be needed on a real PC.

Overall, this program is much faster, more compatible and capable than its predecessor. PC Conqueror Gold Special Edition costs £99.95 all-inclusive. The Special Edition is a £50 upgrade from standard Conqueror and £80 to upgrade from Solution. DR-DOS 6 complete with massive documentation is an additional £79.95. All the programs are available from **Digital Precision Ltd., 222 The Avenue, Chingford, London E4 9SE, tel. 081 527 5493.**

INFORMATION
Program: HardBack & Finder 1.41
Price: £49.95
Supplier: Digital Precision Ltd., 222 The Avenue, Chingford, London E4 9SE. Tel. 081 527 5493.

Hardback & Finder Review

Bryan Davies finally runs Chas Dillon's hard disk utility through its paces.

Some things take a while to get finished, and this review is one of them. It was started in 1990, but there was little point in completing it then, because the supplier was PDQL. Remember that company? Chas Dillon, the program's author, remembers 1990 as being not a very happy time. Since then, the version number of the program has risen from 1.31 to 1.41, showing that Chas has continued to refine it during the intervening two-plus years.

Hardback is designed for use on QLs, with either the Miracle, Rebel or similar hard disk units, and the Thor 8 or 16 with their built-in hard disk. The program is supplied on disk only, and is noted in the DP adverts as requiring 512 KB or more of memory expansion to run (in the instructions, it is suggested that a total memory of 256 KB is sufficient, but it is made clear operations will be slow if plenty of memory is not available). A working program copy can be made using the COPY or WCOPY command. A mouse is not required, or supported.

Backing up

The need for backing up files, and the form backups can take, may be self-evident to the old hands, but it is worth making some points on the subject here. Neither disk nor cartridge is a safe enough medium for a single copy of an important file to be sufficient. In addition, the user's own ability to destroy or corrupt files has to be considered. If you are careful - consistently and make at least one backup copy of each important data file, your need for a back-up program is reduced, but you should still consider the possibility of a disk problem making your program files inaccessible or corrupt. How long would it take to load back all the program files onto your hard disk drive? How long to re-configure the programs afterwards? Do you even know exactly what is on the disk?

HardBack allows the user to back-up odd files, complete directories with or without their sub-directories, or the whole disk. The files to be backed-up can be specified as all, or those which have been changed or created since the last back-up, or those created or changed after a particular date. The program modifies the original files when they have been backed-up, to indicate that they have been archived. Subsequent modification of a file which has been backed-up will automatically reset it to the un-archived state. Should disaster occur, restoration of the file copies can, likewise, be complete or piecemeal. There are additional utilities for managing the hard disk contents, such as printing the directory structure and finding a particular file, by file name or by text contained within it.

Instructions

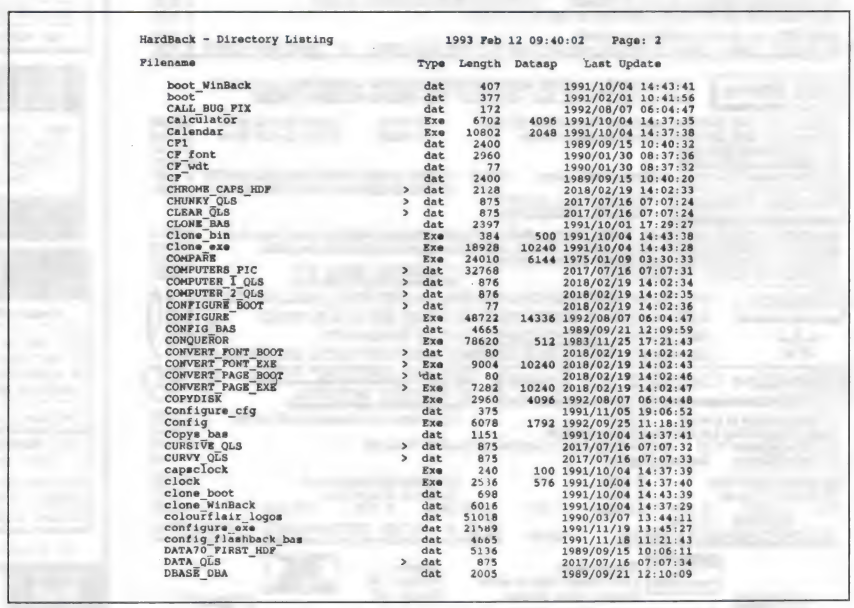
As you would expect, knowing the author, the instructions are concise, and sufficient without being verbose. The manual runs to 33 pages and has a brief contents list, but no index (something I usually look for straightaway). There is no hand-holding - it is assumed the user is fairly computer-literate. This is a reasonable approach with hard disk owners in general, but a few bits of advice at the front would not come amiss; for example, should one run HardBack from floppy disk, or from the hard disk itself?

There is some interesting material in the manual. Apart from instructions on using the program, there is some of the constraints that were experienced in writing it, and these help the user to get a better understanding of why using the hard disk is not as straightforward as one might like it to be. There are some areas in which the software for the various QL hard drive sub-systems differs, sufficiently for Chas Dillon to throw up his hands in horror. My impression is that he feels the approach taken to the Thor hard disk drive software was more correct than that taken with the QL (which is not to say he is happy with the Thor in general, especially later versions of the operating system).

He has done his best to accommodate the two hard drive types that *QL World* readers are likely to be interested in. No mention is made of drives other than Miracle, Rebel and Thor, so users of other types (such as those currently available in Germany) can't be sure if their drives are supported (they should call Digital Precision for information on this.). The Argos (operating system) in the Thor is supported up to version 6.39, but 6.42 had not been tested when the manual was written; 6.40 and 6.41 were known to be "very unstable". The drivers for Rebel and Miracle drives are thought to be the same, and the Miracle version mentioned is 2.02, with extensions versions 2.05 and 2.06 having been used in the testing of HardBack. The Miracle rom version of the drive used for the review was 2.08n, and the Gold Card rom used was version 2.31.

Extensions

For HardBack to function, various SuperBasic extensions must be loaded beforehand. The Toolkit command TK2_EXT is invoked, and the (supplied) Digital Precision *Xtras* file is loaded, by the boot routine. Additional extensions specific to hard disk units (eg MAKE_DIR) should be loaded automatically when those units are powered up. On the review system, there was some trouble with booting-up; this did not occur every time, and had not been evident many months previously with a different Gold Card rom fitted, nor did it happen with the hard disk disconnected. This problem was not related to HardBack, however. The program is started with one of the usual EXEC-type



```
HardBack - Directory Listing          1993 Feb 12 09:40:02    Page: 2

Filename                    Type  Length  Datasp    Last Update

    boot_WinBack             dat     407          1991/10/04 14:43:41
    boot                     dat     377          1991/02/01 10:41:56
    CALL_BUG_FIX             dat     172          1992/08/07 06:04:47
    Calculator               Exe    6702    4096  1991/10/04 14:37:35
    Calendar                 Exe   10802    2048  1991/10/04 14:37:38
    CF1                      dat    2400          1989/09/15 10:40:32
    CF_font                  dat    2960          1990/01/30 08:37:36
    CF_wdt                   dat      77          1990/01/30 08:37:32
    CF                       dat    2400          1989/09/15 10:40:20
    CHROME_CAPS_HDF        > dat    2128          2018/02/19 14:02:33
    CHUNKY_QLS             > dat     875          2017/07/16 07:07:24
    CLEAR_QLS              > dat     875          2017/07/16 07:07:24
    CLONE_BAS                dat    2397          1991/10/01 17:29:27
    Clone_bin                Exe     384     500  1991/10/04 14:43:38
    Clone_exe                Exe   18928   10240  1991/10/04 14:43:28
    COMPARE                  Exe   24010    6144  1975/01/09 03:30:33
    COMPUTER8_PIC          > dat   32768          2017/07/16 07:07:31
    COMPUTER_1_QLS         > dat     876          2018/02/19 14:02:34
    COMPUTER_2_QLS         > dat     876          2018/02/19 14:02:35
    CONFIGURE_BOOT         > dat      77          2018/02/19 14:02:36
    CONFIGURE                Exe   48722   14336  1992/08/07 06:04:47
    CONFIG_BAS               dat    4665          1989/09/21 12:09:59
    CONQUEROR                Exe   78620     512  1983/11/25 17:21:43
    CONVERT_FONT_BOOT      > dat      80          2018/02/19 14:02:42
    CONVERT_FONT_EXE       > Exe    9004   10240  2018/02/19 14:02:43
    CONVERT_PAGE_BOOT      > dat      80          2018/02/19 14:02:46
    CONVERT_PAGE_EXE       > Exe    7282   10240  2018/02/19 14:02:47
    COPYDISK                 Exe    2960    4096  1992/08/07 06:04:48
    Configure_cfg            dat     375          1991/11/05 19:06:52
    Config                   Exe    6078    1792  1992/09/25 11:18:19
    Copye_bas                dat    1151          1991/10/04 14:37:41
    CURSIVE_QLS            > dat     875          2017/07/16 07:07:32
    CURVY_QLS              > dat     875          2017/07/16 07:07:33
    capsclock                Exe     240     100  1991/10/04 14:37:39
    clock                    Exe    2536     576  1991/10/04 14:37:40
    clone_boot               dat     698          1991/10/04 14:43:39
    clone_WinBack            dat    6016          1991/10/04 14:37:29
    colourflair_logos        dat   51018          1990/03/07 13:44:11
    configure_exe            dat   21589          1991/11/19 13:45:27
    config_flashback_bas     dat    4665          1991/11/18 11:21:43
    DATA70_FIRST_HDF         dat    5136          1989/09/15 10:06:11
    DATA_QLS               > dat     875          2017/07/16 07:07:34
    DBASE_DBA                dat    2005          1989/09/21 12:10:09
```

commands, and is therefore multi-tasking. No configuration utility is provided; it is pointed out that knowledgeable users can make device name changes using DP's own *The Editor* program.

There is a noticeable delay after the initial HardBack screen appears; the delay may be related to the number of files on the drive, as there were quite a collection on the review system. A window containing the first files on the hard disk is displayed. Twelve file names are shown in the window. The file list can be scrolled one at a time with the cursor keys, or in blocks of eleven using Shift. In view of the mass of files on most hard disks, the search facility based on the first character of a file name is very handy. The search string is only one character long, though, so you normally get the first file of those having the same first character as the one pressed. One small oddity here was that which file starting with "3" was highlighted when the "3" key was pressed seemed to depend upon where the highlight was when the key was pressed; not that this would cause any problem.

Directories

Directory files (that is, directory names) are denoted by the caret (^) character displayed before them. When a non-directory (that is, normal) file is highlighted, pressing Enter brings up a window containing information on that file. Windows appear a lot in HardBack, and they are handled neatly, enhancing the general impression of the program. The Tab, Shift-Tab and Esc keys perform their standard functions - move to the next item, move back to the previous item, escape from the current menu. For instance, if the Tab key is pressed when one of the file names preceded by a caret symbol is highlit, the structure below that directory is displayed, and so on through the directory tree. The windows containing information are overlaid, but not destroyed, by any subsequent window choice; there is no mess of partial windows as one progresses forward or backward through the structure. In the event that some other (multi-tasking) program corrupts the HardBack screen display, the latter can be refreshed by pressing F4. Help is available via F1; context-sensitive help on extended commands is displayed when Shift-F1 is keyed.

The initial screen offers only three commands, F1/Help, F4/Re-Paint and F3/Commands. The latter key brings up a menu of extended commands. Selection here also is by the first letter of the commands or by moving the highlight to the one required; activation of commands is via Enter or Space. There are 19 commands, and they should cover almost everything any user will want. The names are self-explanatory in most cases:

Backup; Restore; Touch; Mark; Find; Delete; Update; Print; View; Layout; Preview; IndexBk; Untouch; Unmark; Select; Move; NameVol; Graph; Quit.

The essentials are Backup and Restore, to make the copies and to put them back on the hard disk if disaster should strike. Explanations of the commands cover four-and-a-half pages. Here are brief notes on them:

'Touch' simulates a date change to a file without actually changing the date, preparing the file for a "changed files" back-up even though it has not been changed.

'Mark' tags all files in the current window, ready for a further command, eg Backup.

'Find' can locate file names, or text strings within files.

'Delete' erases the highlighted file, or all Mark-ed files.

'Update' re-reads the hard disk and re-displays its contents, removing all Marks in the process.

'Print' lists the directory sub-structure to the specified device, starting from the current window.

'View' displays the highlighted file, as either text or text-plus-hex coding.

'Layout' sets the sequence of file displays, ascending or descending, un-ordered, alphabetic (on name), by file size or by file date.

'Preview' assigns markers to the files that will be saved if either of the two incremental back-up modes is used - all files that have changed since the last back-up, or all files that have changed since a specified date.

'IndexBk' reads the inserted back-up disk and displays the directory structure it finds on it, preparatory to a Restore of the backed-up files being done.

'Untouch' is complementary to Touch, and forces the back-up date of a file to be equal to the update date.

'Unmark' is complementary to Mark, and removes all Marks on files in the current window.

'Select' is a Find-type of operation, but it causes all the found files to be Mark-ed. It affects only those windows which are already opened on the screen.

'Move' allows files or complete directories to be moved within the directory structure. This command was not listed with the others in the instructions but there is (minimal) on-screen help on it, and it is fairly obvious how to use it.

'NameVol' overcomes one of the main weaknesses in SuperBasic, namely its inability to name, or rename, a volume, other than during formatting. The disks onto which back-ups are made must be named according to HardBack's own convention (SECURE0001 etc), and it would be frustrating to have to "go out" to SuperBasic and re-format a disk, when you were about to start a back-up operation, simply to have the correct volume label on a disk. [This function didn't work with the V2.31 Gold Card on the review system; there is a note in the instructions stating that the function will not work with some interfaces, but it was surprising to find the Gold Card in this category.]

'Graph' is another command that was not dealt with in the instructions, but which is quite straightforward to use. It prints the layout of all sub-directories below the current one.

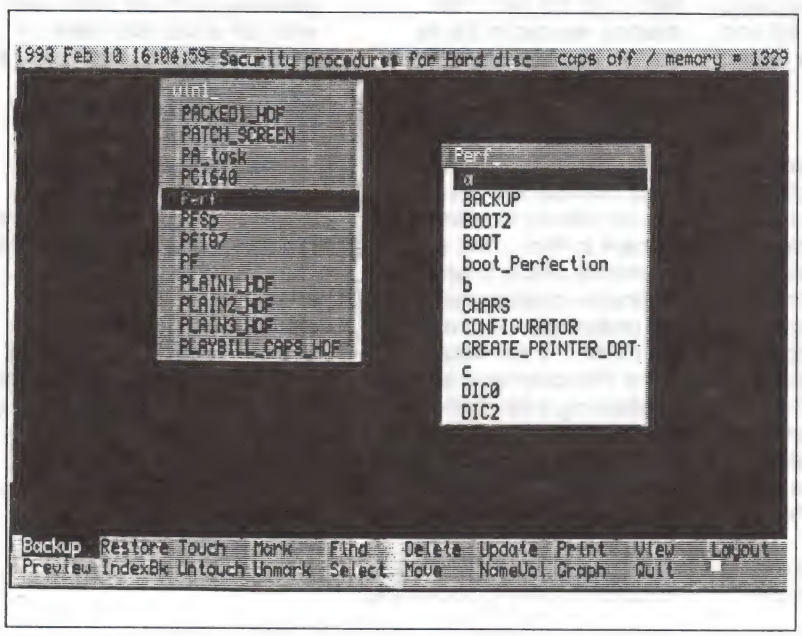
'Quit' shuts HardBack down.

In use

Getting down to the actual mechanism of doing a back-up, the first thing most users will want to do is back-up all files on the hard disk. The Mark function is used for this, and it tags all files on the drive. You can also tag individual, highlighted files by pressing Space. One thing you can be sure of when Chas Dillon is the program writer, is that most, or all, possibilities have been catered for. In this case, you are next asked to choose which of three procedures should be used - "All files", "all Prior", or "all Later", the default being the first one of these options.

If you choose the default option, the files are displayed in the same window, with a Mark (a right-pointing arrow) against each of them. Assuming Mark was used immediately after HardBack was started, all the files on the drive will have been selected, but remember that the selected files are related to the window open when the Mark command was used. If it so happens that you had the highlight on a sub-directory at the time, the tagged files will be only those in that directory, or below it. This situation is shown here in figure one where the ^Perf directory is highlighted and there is a window to its right displaying the files in that directory.

While the Mark command marks every file, it is easy to exclude any of them. All you do is move the highlight to any file name,and press Space to remove the Mark. If you are a Conqueror user, and have created an MS-DOS environment file on hard disk, don't forget to remove the Mark from that file (default name MS-DOS) - HardBack would have trouble trying to back-up a file that



might be 10-20 MB in size! This brings up the matter of floppy disk space. There is an obvious advantage to having ED (Extra-Density) drives - you need fewer disks when they hold over 3 MB each. The back-up operation is appreciably faster, too.

File space

HardBack does what it can to keep the total number of disks required to a minimum. Typically, only a few KB of space is unused. The program checks individual files and fits the maximum number onto each disk. Each disk contains one or more files HardBack creates to keep track of what is in the back-up set, and where everything is. The program does not compress files. However, where necessary, large files are split between volumes.

The next step after Marking files is to select Backup, and the options then offered are "Since save", "Total save", "by Marker" and "from Date", the default being the first. As at almost any stage, you can use F1 here to refresh your mind on what these options represent:

'Since save' causes every file that has been changed/created since the last back-up operation to be backed-up now.

'Total save' saves every file.

'Marker save' saves only those files with a Mark alongside their names.

'From date' allows you to specify the cut-off file date. Files changed/created after this date will be saved, but those before this date will not be saved.

For the first back-up, either the Total or the Mark option is the one to use. Having made the selection, you are then prompted to say whether you want just the current directory, or that directory plus any sub-directories, to be used in the back-up. The next prompt is "Enter Backup device". You could use another hard disk, but the default flp1_ is the obvious device. You have not finished yet - there are a couple more questions. "Read-after_write check required on backed-up files?" Although the default is 'no', and that is the faster option, it would be wiser to choose 'y'. After all, there is a lot at stake in a back-up operation, and there is little point in cutting corners for the sake of a few minutes.

Volume names

You insert the first back-up disk and press any key when it is ready. This is where you find out if you neglected to give the disks the required Volume names. If you did, you are stuck, because you cannot - at this point - access the NameVol command. Memory permitting, you might be able to "cheat", by starting another copy of HardBack, using the NameVol command in that to name all the disks you are likely to need for the back-up, then using Ctrl-C to go back to the other copy and continuing with the Backup. This assumes your interface does support the NameVol command; if not, you can use Ctrl-C and then the SB FORMAT command.

One feature missed when a back-up was initiated was an indication of how much space - and, therefore, how many disks - the back-up files would require. In fact, you can get the basic drive statistics as soon as the initial files window has been displayed, by typing ?, although you must do this for each directory to get totals. This point is made in the instructions, but separately from the command descriptions. You need to have enough formatted, blank disks available, because the back-up will have to be abandoned if there are not enough disks. When the program finds data already on a back-up disk, it requests permission to overwrite it.

During the back-up, the files, together with their sizes, are listed on the screen, in the order they are copied. With an ED drive, the process was quite speedy, taking only a few minutes per disk. It is possible to mix disk sizes, and both HD and ED were used during the review.

Restoring

A back-up is no use unless the copy files can be put back onto the hard drive, and used normally, after gremlins have struck. Not having any desire to wipe existing files off the hard disk, I opted to simply copy-back files over the existing ones, then check that the programs concerned still worked. The Restore command looked to be working fine first time, putting back 67 Perfection program and data files into the Win1_Perf_ and Win1_Perf_Docs_ directories, but it came to a halt with an error message on the seventeenth file.

The same thing happened on the second attempt. Not knowing what an error message means, one can only guess at the reason for a program collapsing, but I suspect what had happened here is that a fault had been found in either the back-up disk or the hard disk. The floppy disk being processed when the stoppage occurred had some bad sectors on it, but they should have been marked as unusable during the format. The hard disk had given trouble during the review of another back-up program and almost certainly has some bad areas on it, but they cannot easily be located and put out of harm's way, and re-formatting is not something I wish to get involved in (especially not with a large MS-DOS partition on the drive). It seems characteristic of such disk defects that making a copy from a file located in a bad area is no problem, but copying it back to the same area results in an error.

Two other Restore operations, with 26 and 69 files respectively, were completed without hitch. Restored programs ran, and everything looked to be as it was before. The Restore operations take little time, and they restore the sub-directory names as well as the files, leaving the user nothing to do other than insert disks, as and when requested. So, provided you make sure all your disks, hard and floppy, are in good shape, there should be no problem with the key operation.

Moving story

The Move command can be fun! Trying to move the file 3D_CAPS_HDF from the root of Win1_ into the Win1_Perf_ directory resulted in the file staying put but being renamed Perf3D_CAPS_HDF. Each attempt that was made added another Perf to the front of the name. This is said to be a bug in the interface software. There was no difficulty transferring the file back to Win1_. The way around the fault is to type the destination directory name with two underscores on the end: Win1_Perf__ in this case.

The Print command is useful for obtaining a list of what you have got on the hard drive, but is somewhat uncontrolled - the one (and only!) use made of it resulted in 21 pages streaming out of the printer, half of them with little print on them. There is no option for setting such things as margins and page length. It might be better to direct the output to a file and format it with a wordprocessor before printing.

The program is referred to as HardBack and Finder, but the latter is integrated into the former, as the Find command. It is not difficult to "lose" files when there are hundreds, maybe thousands, of filenames. You have two options: to find file names, or file data, containing a given character string. The search can be case-sensitive or insensitive. Looking for files with names ending in _T87 (Text87 documents) yielded 7 files from 547, in a few seconds (the review system has a Gold Card). The default window displaying the file names was not quite wide enough to cope with the full path (directory) names of some of the files, but Alt-left/right arrow changes the window width. Alongside the file names there are figures, indicating the location of the search string, in the list of files or in file data. If you request it, you can have a "files found so far" figure displayed during the search.

A case-sensitive string search (using five characters) through file data took rather more than half an hour, to yield 8 files. With a lengthy search like this, the lack of an on-screen "still alive" indicator is a definite drawback. You could easily conclude that the system has locked-up (but my system has the Q_Switch clock ticking away to show that it is still breathing). The lack of an activity light on the Miracle hard disk unit is always unhelpful, and you have to place an ear against the casing and listen for odd ticks, to re-assure yourself something is going on.

The program is competent, and the instructions are generally good. For those users who can afford hard disks but are not particularly well-versed in technical matters, more information would be welcome. For instance, the directory statistics obtained by pressing the ? key contained entries which would not mean anything to some users, and I was unable to relate the number of files listed this way to the number recorded during a Find operation. It is quite easy to get unexpected results; my attempts to do two identical, total back-up operations in succession resulted in more disks being used the second time. Overall, though, the program is comprehensive and does the required jobs well.

SINCLAIR QL WORLD

THE NEW USER GUIDE

SECTION TWENTY FOUR

KEYWORD INDEX

This month in the Keyword Index, Mike Lloyd opens with PROGD$() and PROG_USE, and winds up with REFERENCE from Turbo Toolkit.

PROGD$()
PROG_USE

[Super Toolkit 2]

FILE HANDLING FUNCTION

The Sinclair QL's Qdos operating system was always meant to have awareness of file directories, but this was one of the casualties when the team were rushing to finish the product for its premature launch. Directories can be imagined as separate file storage areas on a single device. Normally, it is possible to use a given filename once on a single device such as a microdrive. With directories, filenames have to be unique only within one directory: on a device with four directories a filename can be used four times, once in each directory. Tony Tebby decided to rescue the incomplete Qdos code, finish it, and incorporate it into Super Toolkit 2. Its facilities have been expanded by Miracle Systems for their Winchester drive and for their more recent and more successful Gold Card. The QL's method of declaring directories is very different from that of PCs and, once it has been adjusted to, can even be thought slightly superior.

The key to directories on the QL lies in the use of the underscore to separate parts of the filename. In the simplest case, a complete filename comprises a device identifier ("flp1" or "mdv2"), an underscore and a name of one or more characters. However, further segments separated by more underscores can be added, such as "flp1_work_docs_backup_myletter". With Super Toolkit you are encouraged to give all executable files the same prefix, such as "flp1_exe_fastgame" or "flp1_exe_quill" and then set a system variable using the PROG_USE command to represent that initial portion of the full filename, for instance:

```
200 PROG_USE flp1_exe
```

Having done this, a Toolkit-equipped QL can launch any executable file with such a prefix to its name simply by referring to the final segment, so "flp1_exe_quill" can be executed with the command:

```
EXEC_W quill
```

even though the file itself has been given the longer name. Unfortunately, Psion did not build recognition of the similar system for data files (DATA_USE and DATAD$) into their programs, which cannot recognise directories. The Miracle Gold Card has very neatly worked round this restriction by allowing you to give directories drive names, so the directory "flp1_data_work_letters" can be given the alias "flp5_".

Having established a directory in which all executable files reside, it might be useful to retrieve that directory name to display on the screen or include in a program. This can be done with the PROGD$() function. It takes no parameters (and so the brackets are optional for all except the purists) and returns a string along the lines of "flp1_exe", or whatever prefix has been set with PROG_USE.

Microdrive users would be foolish to consider dividing the small capacity of their media into directories (although "PROG_USE mdv1" and "DATA_USE mdv2" remain useful options), and for

many double-density diskette users there will be few opportunities to exploit directories to the full. However, lucky owners of the new extra-density (ED) diskettes capable of holding over 4 megabytes of data will have ample space to experiment with the convenience of files directories.

PUT #chan position, item1, item2, item3...

[Super Toolkit 2]

OUTPUT COMMAND
#chanChannel (normally opened to a file)
position(Optional) The offset from the start of the file at which output will be written
item1, etc.(Optional) A comma-separated list of values to be written.

PUT, BPUT and PRINT perform the task of writing information to a channel, each in a distinctive way. Whereas PRINT writes formatted data, PUT writes data in an unformatted manner; in other words, as the data is stored internally. A string is preceded by a two-byte integer representing its length, an integer is written as a two-byte sequence and a floating point value is written as a two-byte binary exponent and a four-byte signed mantissa. To retrieve data written by PUT, SuperToolkit II contains the keyword GET, described earlier in this series.

The first parameter in a PUT statement can be an offset from the beginning of the file, which provides a pseudo-random-access ability. When data is written with PUT, the file pointer is updated automatically. Note that there is no comma separating the channel number and the position (if there is one). The list of one or more items following the first comma are all written in the QL's internal format to the file. This can cause some problems to the interpreter because of the flexibility in variable type provided by coercion. PUT has some neat methods of ensuring that data is written in the correct internal format.

TO	DO THIS
Force floating point type	Add +0, eg 475+0
Force integer type	Add ||0, eg varvalue||0
Force string type	Add &' ', eg charval & ' '

(Note that string type is forced by adding an ampersand and two quote marks - the null string.)

Without any list of values, PUT is a useful tool for resetting the file pointer to some desired location before using any data-writing command. This is particularly useful in conjunction with PRINT, which otherwise cannot easily control where its output will be placed.

RAD(degrees)

TRIGONOMETRY FUNCTION
degreesA floating point value

The RAD() function converts between degrees and radians. A radian is a section of a circle' circumference which matches the length of the circle's radius. Just over six radians are needed to make a complete circle, as is suggested by the widely-known formula 2*PI*radius that represents the relationship between a radius and a circumference. As there are 360 degrees in a circle, roughly 57 of them are needed to cover an arc of one radian.
Radians are more important than degrees in computer trigonometry because of their relationship with the COS() and SIN() functions. If a circle one unit in radius was drawn with its centre at the graphics origin (use the command SCALE 4, -2, -2 to make this visible on screen) the command LINE SIN(1), COS(1) would draw a radius from the centre to a point one radian away from the 12 o'clock position in a clockwise direction.

RANDOMIZE value

PSEUDO-RANDOM NUMBER GENERATOR
value A floating point value

The QL can generate what appears to be a random sequence of values. They are not strictly random because, providing you start with the same value, the sequence can reliably be repeated. This might appear to be something of a disadvantage, but it has a value when creating large sequences of test data that may need to be repeated value for value at a later date. Unless instructed otherwise, the QL "seeds" the random sequence using its clock. The RANDOMIZE command, without any parameter, forces the QL to begin a new random sequence by referring once more to its internal clock. For a more predictable sequence, a value can be added to the RANDOMIZE command that it will use in preference to the current time. Whatever random numbers then appear, they can be reproduced exactly by using the same parameter with RANDOMIZE.

READ var, var, var...

EMBEDDED DATA COMMAND
var A variable name

Like all Basics, SuperBasic allows data to be read from DATA lines in programs in an analogous way to reading data from a file or other input channel. In fact, the similarity is so strong that programmers frequently attempt to READ from a channel when what they need to do is INPUT. The following snippet will be used to demonstrate the important features of READ and its associated keywords DATA and RESTORE:

```
100 DATA 100, "One Hundred", 24.3, "Last item"
110 READ value%, text$, fraction
120 PRINT text$
```

The DATA keyword is described earlier in the New User Guide. It identifies a line of comma-separated values that can be assigned to variables by the READ command. Like DATA, READ can take several parameters each separated by a comma. There is no need to match DATA line with READ line, but it is important to ensure that the variable types always match (unless you want to rely on coercion to sort out discrepancies).

If the example snippet were to be run just once there would be no problems: the data values match up with the variables in the READ statement. At the end of the program all of the variables in the READ statement have values assigned to them and the last item in the DATA list remains unread. Should the program be run for a second time, however, an error will result. The interpreter will attempt to push the last data item into the "value%" variable and will generate a type mismatch error. It was decided, for the benefit of the few times when it might be useful, that the RUN command will not perform an implicit RESTORE.

Before you feel tempted to place large quantities of data into DATA statements, remember that they can form a significant part of a program's bulk and therefore occupy valuable memory space. If the DATA items are read into lots of different variables, such as a large array, for instance, the memory loss is doubled: once for the DATA statements and once to store the variables. A colleague of mine thought up the elegant solution of MERGEing DATA statements from files on an as-required basis, but an even better solution is simply to INPUT the data from files and avoid using READ altogether.

RECHP base

[Super Toolkit II]

MEMORY MANAGEMENT COMMAND

base	The base address of an area of memory allocated with ALCHP() function

The QL is able to rope off chunks of memory for whatever purpose its programmer can devise, usually to store raw data or to hold machine code programs. Allocations are made from what is called the "common heap", or what's left once the Qdos system areas have been allocated. Unlike most parts of the QL's memory, common heap allocations stay in the same place throughout the execution of a program. Memory is allocated by a function such as ALCHP() that returns the address of the first byte to be reserved. This should almost always be stored in a variable for future reference.

There will come a time when allocated memory is no longer required and it can be returned to the heap for re-allocation. To do this, RECHP (short for reclaim common heap) needs to know the base address of the memory being returned. Cleverly, it does not need to know how much memory to remove as Qdos can look this up for itself. However, unless common heap memory is contiguous it cannot be re-allocated, so the sequence in which memory is released is of great importance.

RECOL #chan, col0, col1, col2, col3, col4, col5, col6, col7

SCREEN HANDLING COMMAND

#chan	(Optional) A valid screen channel
col0...col7	Integers representing colours according to the following table:

VALUE	COLOUR
0	Black
1	Blue
2	Red
3	Magenta
4	Green
5	Cyan
6	Yellow
7	White

On QLs unmodified by go-faster utilities, Gold Cards and the like, watching RECOL operate on a large area of the screen is marginally more interesting, and takes marginally less time, than watching treacle run down the side of a tin. The object of the exercise is to change any or all of the colours on a screen to some other colours. The eight mandatory parameters of the RECOL command represent the full low-definition colour-set. The position of each parameter indicates the current colour (ie the third parameter affects all red pixels, the eighth all white pixels) and the value represents the colour to which those pixels will be changed. RECOL 0,1,2,3,4,5,6,7 has no effect whatever because the colours are

changed to themselves. RECOL 7,6,5,4,3,2,1,0 changes every pixel to its inverse colour, but there is an instant way of achieving this effect:

```
100 OVER -1
120 BLOCK 200, 100, 20, 20, 7
```

Provided there is no rush, interesting effects can be obtained using a succession of RECOL commands. For instance, the following gradually fade out a multi-coloured display to a uniform green:

```
100 RECOL 0,1,2,3,4,5,6,4
110 RECOL 0,1,2,3,4,5,4,4
120 RECOL 0,1,2,3,4,4,4,4
130 RECOL 0,1,2,4,4,4,4,4
140 RECOL 0,1,4,4,4,4,4,4
150 RECOL 0,4,4,4,4,4,4,4
160 RECOL 4,4,4,4,4,4,4,4
```

Sadly, RECOL 0,1,2,3,4,5,6,7 does not restore the display back to its former glory: RECOL's transformation is permanent. In high-resolution mode it is only necessary to change the four colours it is capable of supporting. However, even in Mode 4 all eight parameters are still mandatory.

REFERENCE var1, var2, var3,...

[Turbo Toolkit]

	COMPILER DIRECTIVE
var1, etc	A variable or array name

When a programmer passes a parameter to a user-defined procedure or function, SuperBasic follows simple rules to determine whether any changes to that parameter's value shall remain once the routine has been exited. The string "Hello World" might, for instance, be passed to a parameter called ALTER that turns it into "Goodbye Everyone". The output from the following snippet will determine whether the change survives the return from the parameter definition:

```
100 message$ = "Hello World"
110 ALTER message$
120 PRINT message$
```

If the PRINT statement produces the message "Goodbye Everyone" then the ALTER procedure will have altered the variable permanently. If, however, the variable was changed in the ALTER procedure code but the PRINT statement at Line 120 proved that the message$ variable had reverted to read "Hello World" again, then the changes would not have survived the return to the main program.

These phenomena are described as "passing by reference" and "passing by value". When a variable is passed by reference, the parameter in the procedure that temporarily represents that variable is set up so that it refers to exactly the same part of the variables area in the QL's memory. When a variable is passed by value, the parameter in the procedure is established in another part of the QL's memory and initialised with the value of the variable passed to it.

SuperBasic's simple rules are to pass variables by reference and expressions by value. If you want to pass a variable by value, simply make SuperBasic think it is part of an expression. This is most easily achieved by putting the variable name in brackets in the calling statement. ALTER (message$) might transform the text from "Hello World" to "Goodbye Everyone" within the procedure code, but because the variable was passed in an expression and was therefore passed by value the end result, once the procedure was complete, would be no change whatsoever.

The Turbo Toolkit, however, handles matter slightly differently. By default, Turbo passes variables by value. In order to pass a variable by reference a REFERENCE directive must be placed immediately before the appropriate DEFine PROCedure line to inform the compiler of your intentions, as in:

```
400 REFERENCE name$
410 DEFine PROCedure ALTER (name$)
420...
```

The Turbo Toolkit's conventions apply equally to arrays, but you must remember to use dummy subscripts to indicate the number of dimensions Turbo must cater for:

```
500 DIM text$(15, 12, 20)
510 Fill_up text$
...
600 REFERENCE text$(0,0,0)
610 DEFine PROCedure Fill_up
620 ...
```

It does not matter at all what integers are used as subscripts in the REFERENCE directive: the compiler simply counts how many numbers are there. Incidentally, Turbo Toolkit implements REFERENCE as a new but meaningless keyword in SuperBasic so that you can test your code with the interpreter before compiling it.

QLQ continued

Before A F Wilson was interrupted back in January, he was talking about Merz'z QLQ

Figure three illustrates the results achieved with downloadable fonts. You will have probably noticed from the printouts that the QLQ extra fonts are all proportionally spaced, although pica and elite fonts are also catered for. Elite mode was used for the SCIENCE_QLQ font. All the printer functions, Bold, Underline, Outline, Shadow, Enlarge, Italics, Sub/Super-script, etc. can be applied to the downloadable font, just as for the built-in printer rom fonts. The DEMO_bas program demonstrates some of the above printer functions. For instance, say you wanted to print a _TXT file using oldenglish as the default printer font. LRUN the QLQ boot file to initialise the toolkit extensions and then type the following:

```
NEW
10 LQ_dev ser1
20 LQ_load
flp1_eng_oldenglish_qlq
30 LQ_download
eng_oldenglish
40 copy flp1_ascii32127_txt to
ser1 or 40
open#3,ser1:print#3,"!"#$%&'()*+,-
./0123456789
<=>?@ABCDEFGHIJKLMNOPQR
STUVWXYZ[\]^_£abcdefghijklmno
pqrstuvwxyz{|}~_"
50 close#3
```

Get FontED

The 24-pin printer FONT_EDITOR included with QLQ was a welcome addition to the QL scene. The FONT_EDITOR was initialised with EXEC flp?_FONT_EDITOR_english. Only two pages of the manual were devoted to the FONT_EDITOR. Fortunately, using FONT_EDITOR was intuitive as a result of the QPTR interface and the clear layout . The FONT_EDITOR window was split into two main sections - font/file menus and the character/font sketchpad. The sketchpad is blank apart from three horizontal straight lines. I suspect that these lines were guidelines for upper/lower-case, sub/super-script and descenders (in characters g,y,p and y). A feature sadly missing was the lack of character width guidelines for pica, elite and proportional modes. Also missing was a grid toggle to help with positioning and drawing of the character or symbol.

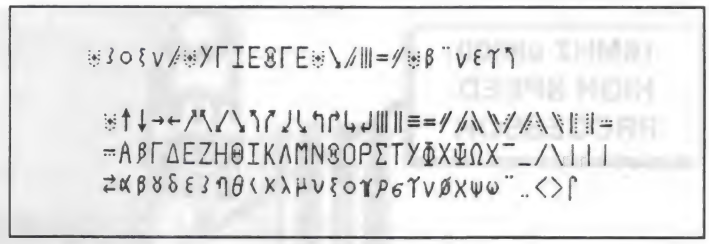
Drawing

Drawing a character or symbol required a bit of imagination and preferably a mouse. I found using the cursor keys with space bar (ink on) and Enter (ink off) not only limiting to artistic expression but also very tiring on my hands and wrists. The default arrow pointer icon changes to a PENCIL icon when drawing in the sketchpad area, however, no eraser appeared when deleting. The Options menu was located above the sketchpad from which Pica, Elite, Proportional, Character Spacing and Copy Font can be selected. In addition, a special Control Code option was available. This was necessary for printers which treated character codes 128 to 159 as non-printable Ascii codes 0 to 31. In both pica and elite print modes, defined characters are centred, which on occasions caused problems. Best to have left justification to the discretion of the user, particularly if special characters/symbols were required.

From the Options menu select Elite, and then draw a horizontal straight line across the length of the sketchpad. Now, re-select Options. You will have noticed that Elite has been toggled to Proportional, however, there was no indicator to alert the user of the change. Proportional mode resulted because the LQ elite character width was narrower than the sketchpad; refer to your printer manual for print mode widths. Pica, elite and proportional print mode width guidelines would have avoided the above scenario and improved both presentation and usefulness. Scroll arrow bars surrounding the sketchpad allow the character definition to be moved around the sketchpad, with left, right, up and down supported. This feature was particularly useful when designing the arrow symbols for the science font.

Screen layout

Two different fonts can be loaded at a time, however, only font A was editable, as shown in Figure two (Font A = ENG_OLDENGLISH_QLQ and Font B = SCIENCE_QLQ). These two font windows not only display the unique character definitions associated with the fonts loaded but also the Ascii code number in hexadecimal (H) and the default Ascii character definition, if printable.



The surrounding arrows bars are for forward and backward scrolling of the loaded font (or character set). The character definitions will scroll according to the defined I/O range. Again, use the arrow bars surrounding the I/O range to update the font definition range - 0 to 255, or 32 to 159, or whatever. The fonts illustrated in Figure three will be used to highlight FONT_EDITOR operations. The old english 'A' character replaced Ascii code 41H (or Ascii definition 'A'). Whereas, the symbol Sigma replaced the default Ascii code 51H (or Ascii defintion 'Q'). For instance, sending Ascii code 51H with font B downloaded will result in the symbol Sigma being printed.

To load a font into the FONT_EDITOR was a simple task. Move the mouse or cursor keys to the 'file name:' window, press space bar, type in the font name to be edited, and press Enter. The pointer was to the IO menu, and using the arrow bars selected the desired file operation (LOAD Font A , MERGE font A, SAVE font A, LOAD Font B, NEW FONT and QUIT Font_Editor). As illustrated in Figure two, SCIENCE_QLQ was loaded as font B and ENG_OLDENGLISH_QLQ as font A. Note that loading a Font into A has a safety Yes/No prompt so that fonts are not accidently erased.

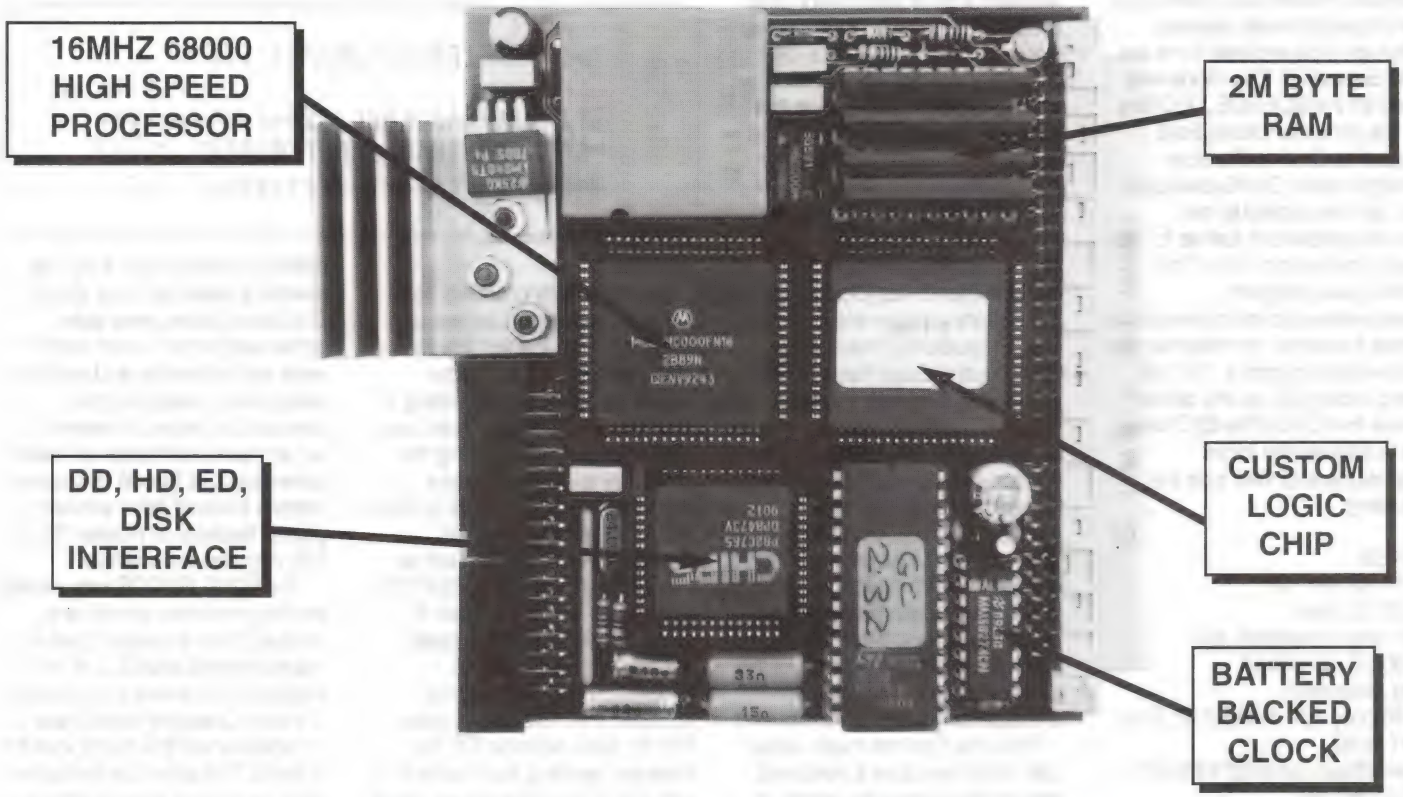
Commands

The Command options only operate on the character displayed in the sketchpad, and not on the whole character set. Again, only applied to Font A. The commands available were Exchange, Copy A to B, Copy B to A, Mirror X, Mirror Y, Outline, Bold and Clear. Exchange was another name for swap, so that oldenglish Ascii code 41H became science Ascii code 51H and vice versa. With Copy A to B, science Ascii code 51H was overwritten with oldenglish Ascii code 41H. The reverse applied for Copy B to A. Bold and Outline were style enhancers. Mirror X and Mirror Y were self explantory and were very useful when designing the science font arrows. However, it would have been better to have a command like 'Rotate by degree' instead. It would have allowed greater flexibility. to Rotate 180, or 270, degrees, for example.

The FONT_EDITOR was visually exciting; however, as with any product there is always room for improvements and QLQ is no exception. An eraser icon (similar to that in Qdesign) would have complemented the pencil icon for drawing. The arrow bar indicators were particularly small and fiddly. A resize button would have alleviated this, and improved both readability and usability, especially for the many older QL users and some of our younger users. As already stated, more grids and/or guidelines are desirable, and how about an improved Mirror command?

Overall, I was very impressed with the quality and usefulness of QLQ and would highly recommend it to any one with a 24-pin printer. QLQ is a bargain when you consider the cost saving if you had to buy additional rom fonts for your printer. My only major complaint with QLQ was the lack of an English boot file. I am sure this has been rectified by the time you read this. Please note: QLQ includes the necessary QPTR extensions, and does not require Qpac2 to operate properly. I hope my experiences of interfacing QLQ and Perfection will help other users. Please note, the screen dumps were captured and printed using Qdesign.

MIRACLE



QL GOLD CARD

£225 inc. (£200 outside EC)

This is the expansion that has been revolutionising the QL. It is very easy to fit - it simply plugs into the expansion port at the left hand of the QL - and once fitted it will instantly increase the execution speed of the QL by about 4 times due to the presence of a 16MHz 68000 on board. There is 2M of fast 16 bit RAM of which QDOS sees a contiguous 1920K. The remainder is used for shadowing the QL's ROM and display memory and for the GOLD CARD's own code.

There is a disk interface which can access 3 mechanisms (4 with the DISK ADAPTER) of 3 different densities, DD (double density, 720K), HD (high density, 1.44M) and ED (extra high density, 3.2M) in any mix. The disk interface connector is the same type that was fitted to the TRUMP CARD so most QL compatible disk drives can be used. Please note that DD drives still give a capacity of 720K per diskette. Our DUAL ED DISK DRIVE allows the GOLD CARD to access DD, HD and ED diskettes.

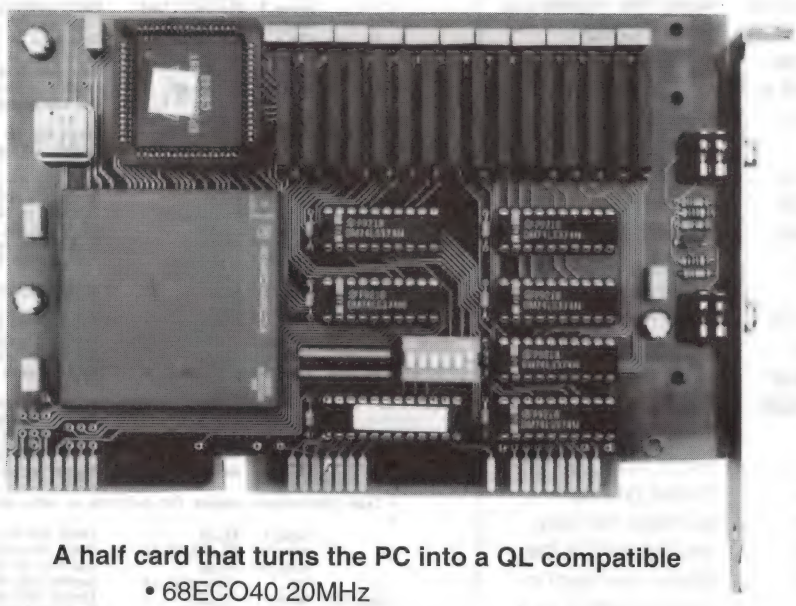
Another feature is the battery backed clock. When the QL is switched on the contents of the clock are copied into the QL's clock so that the time and date are correct. The firmware in the ROM gives the GOLD CARD all the functionality of the TRUMP CARD like TOOLKIT II and there is a sub-directory system for floppy and RAM disks.

Physically the GOLD CARD is about half the size of the TRUMP CARD and so fits almost all within the QL. Its current consumption is well under the allowable maximum so no special power supply is required. The GOLD CARD comes with a 14 day money back guarantee and a 2 year warranty.

SYSTEMS

Coming soon...

THE QXL



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Simon Goodwin sets out to search his memory faster than ever before.

DIY toolkit

Back in the Maxwell days, I received a request from P. Monstad of the Norwegian All-Sinclair Association, NASA. At last I can grant that wish - with a fast case-independent version of the SEARCH_MEMORY function.

MSEARCH can find any text or binary data in memory at astonishing speed. It scans the entire memory of a Gold Card in under four seconds, converting case as it goes along, and manages 750K per second for binary data. A standard 68008 QL with Expanderam searches for typical data values at 100-160K per second.

The Amiga 500 on which I'm typing this article can search 250K per second at the default blitter priority, rising to over 300K per second if I slow down display updates with SCR_PRIORITY 1,2 to let the 68000 run at its full 7.18 MHz. My test machines use JM, JS and Minerva 1.93 versions of Qdos.

Whatever your system, this is much faster than the inbuilt INSTR function, and there is no need to PEEK the data out of memory before you search it. Like most other QL string operations, MSEARCH considers small and capital letters to be equivalent, correctly handling the accented letters in the second QL fount, as well as English letters.

Speed limit

I've been building up to this project for a while. Last year's INARRAY functions included fast code to compare integers and floating point values, but they used the standard rom string comparison, limiting speed to 3K per second; that would take over a quarter of a minute to search the QL rom, and three and a half minutes to scan 600K.

It's certainly worth going faster than the Sinclair routines, but compatibility is important. The MSEARCH routine is fast because it does not do unnecessary work. This makes it a good example.

MSEARCH weighs in at 404 bytes - bloated compared with SEARCH_MEMORY but not bad considering that it ignores letter case and includes four different scanning routines.

MSEARCH takes three parameters. The first two are whole numbers limited only by available memory, and the third is the pattern you want to look for, written as a string or string expression. The first parameter is the start address for the search, followed by the length of the area to search in bytes, so:

```
PRINT
MSEARCH (0,
49152, "not
complete")
```

shows the address of the start of the error messages on an English-language QL.

To use MSEARCH you must type in one of the listings, or obtain it on tape or disk by post from DIY Toolkit. *Listing one* is the assembler source, tested with QL Devpac 2.0, while Listing two is a

```
* Version 0.7, Copyright 1993 Simon N Goodwin.
*
initialise lea.l    define,a1
           movea.w  $110.w,a2       BP.INIT vector
           jmp      (a2)
*
* address = MSEARCH ( address, length, string$ )
*
msearch    lea.l    3*8(a3),a0      Three parameters are required
           cmpa.l   a0,a5
           bne      bad_param       Otherwise report 'bad parameter'
           move.l   $58(a6),d7      Save BV.RIP, maths stack pointer
           subq.l   #8,a5           Conceal the last parameter, for now
           movea.w  $118.w,a0       Fetch the CA.GTLIN vector
           jsr      (a0)            Try to get two long integers
           bne      bad_exit
           movea.l  0(a1,a6.l),a4   Fetch address parameter
           move.l   4(a1,a6.l),d5   Fetch search length parameter
           ble.s    bad_param       This must be greater than zero!
           move.l   a5,a3           Prior end is new start
           addq.l   #8,a5           Retrieve last parameter
           movea.w  $116.w,a2       Fetch the CA.GTSTR vector
           jsr      (a2)            Get the string onto the RI stack
           bne.s    bad_exit
           move.w   0(a1,a6.l),d2   Fetch string length
           ble.s    bad_param       Reject null or inplausible pattern (>32K)
           ext.l    d2
           move.l   d5,d3           Copy the target length for checking
           sub.l    d2,d3           D3 counts possible match positions
           bcs.s    bad_search      Pattern is longer than target!
           movea.l  a4,a0           A0 points to memory to be scanned
           moveq    #0,d6           Presume no letters in pattern
           move.b   2(a1,a6.l),d1   Pick up the first character
           bsr.s    check_case
pick_scan  subq.l   #2,d2           D2 is remaining pattern length for DBRA
           bmi      scan_just1
           lea.l    3(a1),a3        Point A3 at the second character
           move.b   d1,d5           Save first byte for later
           move.w   d2,d0           Copy count for pattern case conversion
case_lock  move.b   3(a1,a6.l),d1   Pick up each pattern byte after first
           bsr.s    check_case
           move.b   d1,3(a1,a6.l)   Store corrected code
           addq.l   #1,a1           Advance to the next
           dbra     d0,case_lock    Scan all the rest of the pattern
           tst.b    d6              Were there any letters?
           beq.s    multiscan       No, so we can rush ahead
*
* Case-independent scanner for patterns of more than one byte
*
           subq.l   #1,a3           Check entire string if quick test OK
           move.b   d5,(a3,a6.l)    Store corrected first byte
           addq.w   #1,d2           Add one to length for later checks
           lea.l    slow_scan,a4    Record top of loop for later retries
slow_scan  moveq    #32,d1          Ensure the case bit is set
           or.b     (a0)+,d1        Mask in a byte from memory
           cmp.b    d5,d1
slow_retry dbeq     d3,slow_scan    Loop till first byte seems to match
           bne      searched        No match yet; scan complete?
           movea.l  a3,a1           A1 points to the text
           lea.l    -1(a0),a2       A2 points to the possible match
           move.w   d2,d4           Temporary count variable

           bsr.s    check_case      Slow but sure
           cmp.b    0(a1,a6.l),d1
           addq.l   #1,a1           Advance through the pattern
           dbne     d4,check_rest   Check all characters after the first
           bne.s    slow_retry      Mismatch, start again
           bra.s    found
*
bad_param  moveq    #-15,d0         BAD PARAMETER error code
bad_exit   rts
*
bad_search moveq    #0,d1           Return zero, pattern not found
           bra.s    end_search
*
* Check case of D1, set D6 if alphabetic, convert if necessary
*
check_case cmpi.b   #'A',d1         Check for capitals or greater
           bmi.s    not_alpha       No, get on
           cmpi.b   #171,d1         Past OE, end of second caps/lower block?
           bhi.s    not_alpha       58% of codes excluded so far!
           tst.b    d1              Separate out codes >127
           bmi.s    eight_bit
           cmpi.b   #'Z',d1         ASCII capital letter?
           bls.s    fix_case
           cmpi.b   #'a',d1
           bcs.s    not_alpha       One of the set [ \ ] _ ^ £
           cmpi.b   #'z',d1
           bls.s    flag_text       It's lower case
not_alpha  rts
*
* If we get this far, the code is in the range 128 to 171
*
eight_bit  cmpi.b   #160,d1         At or after A umlaut?
           bcc.s    flag_text       Leave the case bit set
           cmpi.b   #139,d1
           bhi.s    not_alpha       Code has no upper case equivalent
fix_case   ori.w    #32,d1          Set the bit determining letter case
flag_text  moveq    #1,d6           Indicate that a letter was found
           rts
*
* Exact scan for patterns of more than one byte
*
multiscan  lea.l    scanner,a4      Record top of loop for later retries
scanner    cmp.b    (a0)+,d5        Check for the first byte
retry      dbeq     d3,scanner
           bne      searched        No match yet; scan complete?
           movea.l  a3,a1           A1 points to the rest of the text
           movea.l  a0,a2           Save point reached for retry later
           move.w   d2,d4           Temporary count variable for the rest
```

for corresponding hex data. When you type in and run Listing two it checks the data and creates a small code-file on any device you choose.

Once you have created FLP1_MSEARCH_CODE you can link the function to SuperBasic with these commands:

```
X=RESPR(404)
LBYTES
FLP1_MSEARCH_CODE,X
CALL X
```

Full source code and documentation for MSEARCH has been added to DIY Toolkit Volume X, where it joins the useful if suspiciously self-referential VOCAB command from last September's *QL World*. This is one of 22 volumes of DIY routines, available on our disks or your cartridges, at a price of three pounds per volume plus four pounds media and handling per order.

Sadly Richard Alexander is leaving the QL market, so the *DIY Toolkit* disks will cease to be available after 31st March 1993. All orders received before that date will be honoured, so if you want to save yourself lots of typing write promptly to DIY *Toolkit, Cwm Gwen Hall, Pencader, Dyfed, Cymru SA39 9HA,* or call (0559) 384 574 for details of the bundles available.

How it works

Listing one reveals the internal structure of MSEARCH. After a common routine to fetch and check parameters, it splits four ways at PICK_SCAN, depending on the length of the pattern and the presence or absence of alphabetic characters.

The simplest scanner is near the end of the listing. SCAN_FAST uses two instructions per byte to look through memory at (A0) for the value in D1. If a match occurs DBEQ stops with the zero flag set, so execution continues at FOUND, returning the match address to SuperBasic.

All the searchers get back to Basic via END_SEARCH, which returns the memory address of the start of the match, or zero if no match was found. They also share the code labelled SEARCHED, right at the end of the listing.

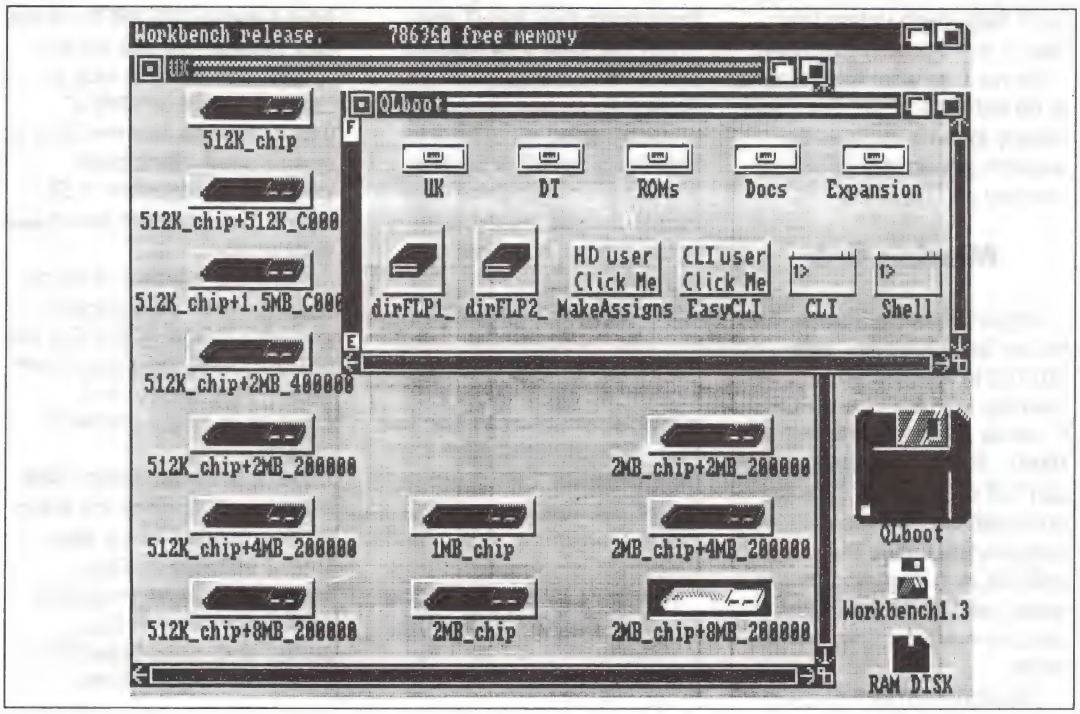
SEARCHED counts down in 64K units till D3.L reaches zero; the individual search loops are limited to 65536 comparisons each by the word count used by DB instructions. These count down from 65535 to 0 then 65535, so ADDQ.W and SUBQ.L are needed to tally 64K sections and detect the final zero count. Each searcher points A4 at the start of its code, so SEARCHED can return quickly with JMP (A4) if there's more work to be done.

```
scan_rest  move.b   (a2)+,d0
           cmp.b    0(a1,a6.l),d0
           addq.l   #1,a1              Advance through the pattern
           dbne     d4,scan_rest       Check all characters after the first
           bne.s    retry              Mismatch, start again
found      move.l   a0,d1              Eureka!
           subq.l   #1,d1              Compensate for increment in SCANNER
end_search subq.l   #6,d7              Make room for a floating-point value
           move.l   d7,$58(a6)         Tidy the BV.RIP maths stack
           movea.l  d7,a1
*
*
return_fp  move.w   d1,d4              D4 will be exponent
           move.l   d1,d5              D5 will be mantissa
           beq.s    stack_fp           Zero is a trivial case
           move.w   #2079,d4           First guess at exponent
           add.l    d1,d1              Already normalised?
           bvs.s    stack_fp
           subq.w   #1,d4              N  halve exponent weight
           move.l   d1,d5              m  mantissa to match
           moveq    #16,d0             Try
*
normalise  move.l   d5,d1              Take copy of m
           asl.l    d0,d1              Shift mantissa D0 places
           bvs.s    too_far            Overflow; must shift less
           sub.w    d0,d4              Correct exponent for shift
           move.l   d1,d5              New mantissa is more normal
too_far    asr.w    #1,d0              Halve shift distance
           bne.s    normalise          Try shift of 8, 4, 2 and 1
stack_fp   move.l   d5,2(a1,a6.l)      Stack mantissa
           move.w   d4,0(a1,a6.l)      Stack exponent
           moveq    #2,d4              Floating point result
           moveq    #0,d0
           rts
*
* Search for the byte in D1 from A0 onwards for D3+1 bytes
*
scan_just1 tst.b    d6                 Does letter case matter?
           beq.s    scan_exact         No, so go extra-quickly
           lea.l    scan_one,a4
scan_one   moveq    #32,d0             Load the mask to ignore the case bit
           or.b     (a0)+,d0           Mask in the memory contents
           cmp.b    d0,d1              Does it SEEM to match?
           dbeq     d3,scan_one
           bne.s    searched           D3 count exhausted, try another 64K?
           move.b   d1,d0              We'd better make a more certain test
           move.b   -1(a0),d1          Pick up the unadulterated code
           bsr      check_case         Convert it the hard way
           cmp.b    d0,d1              Does it STILL match?
           beq.s    found              A genuine match, return its position
           jmp      (a4)               Try again, hope springs eternal...
*
* Search through memory from A0 onwards for the exact byte in D1
*
scan_exact lea.l    scan_fast,a4
scan_fast  cmp.b    (a0)+,d1
           dbeq     d3,scan_fast
           beq.s    found              A match, return its position
searched   addq.w   #1,d3              Clear low word (previously -1)
           tst.l    d3                 Is there more to be done?
           beq      bad_search         No - so the search was fruitless
           subq.l   #1,d3              Decrement high word & restore low word
           jmp      (a4)               Look through another 64K
*
define     dc.w     0                  No procedures
           dc.w     0                  End of procedures
           dc.w     1                  One function
           dc.w     msearch-*
           dc.b     7,'MSEARCH'
           dc.w     0                  End of functions
           end
```

No case

If the pattern is a single alphabetic character, SCAN_FAST is not appropriate, as we must take account of capitals and lower case. The SCAN_ONE loop uses four instructions per byte, as it sets bit 5 of the value from memory before comparing. This has the effect of making capitals and lower-case codes equivalent, as that's the bit which discriminates between big and little letters.

That simple rule generates some unwanted matches - for instance spaces CHR$(32) and nulls CHR$(0) are seen as equivalent. If the loop indicates a match we must call CHECK_CASE to convert the data byte slowly and precisely before jumping to conclusions,



but most of the time the quick test allows us to step right on, and the average speed runs close to that of the initial loop.

Further up the listing you'll find SCANNER and SLOW_SCAN. These are complicated, because they look for patterns of more than one character, but the initial test is the same; only if that matches do the searchers check the rest, in relatively leisurely style.

The case-independent SLOW_SCAN uses the ORI.B #32 trick at first, then checks the entire string with calls to CHECK_CASE if it finds an initial match. SCANNER is only used if there are no letters in the pattern, so it can ignore case and check characters precisely from the second onwards if the first is a match.

Sinclair's rom is slow because it standardises the case of each character as it goes along, so the time to compare any character is relatively lengthy. Notice how MSEARCH converts the pattern to consistent case once at the start, around CASE_LOCK, avoiding the need for repeated conversion later.

Improvements

There were a few bugs in my original SEARCH_MEMORY, written in 1986, so I have taken pains to avoid these in MSEARCH. The old routine used self-modifying code to save space, patching the scanner to suit one or multi-byte patterns. This was neat but unwise because it prevented the code from running in rom, and could cause problems if a task started to run the code while another was already using it, relying on the patch.

QL extensions should be re-entrant, so that several tasks can run them at once. If this is not practical because of large internal data-areas, the code can run in supervisor mode, so other tasks are not selected until it has finished, but that is best avoided as it makes multi-tasking sporadic.

Under rare conditions SEARCH_MEMORY can fail because it uses an absolute pointer to the string parameter, held on the SuperBasic RI stack. This should be relative to A6, as it is in MSEARCH, so that SuperBasic can move without the function losing track of the string. This hardly affects speed, as the first character of the pattern is held in a register while searching.

The speed of MSEARCH could be increased still further by 'unrolling' the scanning loops to check for two or more characters each iteration, but be careful not to skip too far ahead if a partial match is found - the expected pattern may come just after.

Optimisations

The optimisations are dependent on the first character being relatively rare. The worst case comes when the first character of the pattern matches most of the memory bytes - often true when searching an empty area for a long word address under 24 megabytes. This can slow a Gold Card to 175K per second. Care is still needed to make sure that the overhead incurred after an initial match is not too great.

More sophisticated searchers look for the least common byte in the pattern first, and then check the ones around a match in order of occurrence in the whole memory area. This approach relies on statistical information about the distribution of values; it's possible to write a SuperBasic shell for MSEARCH which mixes subtlety with its brute force, but it won't help much unless your data is appropriately structured.

I'm not sure what NASA intend to do with MSEARCH, but I have already found it useful when searching heap and RESPR memory and exploring files.

Missing link

MSEARCH is the missing link for fast file conversion - use LBYTES to load the file into memory, MSEARCH and POKE to locate and change MDV1 to RAM1_, FLP3_, or whatever, then SBYTES or SEXEC to store the converted file. The case-independent nature of MSEARCH is ideal here as it spots mdv1, Mdv1 and more obscure equivalents as well as MDV1.

This approach benefits from the efficiency of MSEARCH, so much faster than INSTR, but unless your drives are really fast you'll save more time through efficient file handling. LBYTES and SEXEC are usually several times faster than INPUT and PRINT, because they read the whole file in one go rather than sequential sectors. This means a typical speed-up of three to nine times on FLP, and up to 200 times on microdrive if the next sector passes the head before the last has been fully digested.

The cost is the temporary need for more memory - but on an expanded QL it's rare to fnd a single file that is larger than available ram. You can also use MSEARCH to detect alien line terminators like 'CR/LF, with a SuperBasic function call like this:

```
new_base = MSEARCH(base, space, CHR$(10) & CHR$(13))
```

P. Monstad cited SEARCH_MEMORY(0,49152,"SINCLAIR") as an example - this returns 0 unless you substitute MSEARCH, as original QL roms hold the text "Sinclair", in mixed capitals and lower case. If you have Minerva MSEARCH will not find "Sinclair", but you will find "QView", whether you look for "qview", "Qview" or "QVIEW" (how's that, Lau, four mentions in one column!). *(We'd quite cheerfully mention'em in QL Scene if one of them would just write to us.)*

The word "Minerva" does not appear, except as a packed graphical image; MSEARCH can only spot Ascii text, though I can explain neat ways to find graphics in a file if anyone is curious.

That's all for this month. Next issue I shall report on the boom in 'ZX emulators' to run early Sinclair software on Qdos machines. As ever, I welcome your suggestions for future articles and useful SuperBasic extensions, c/o QL World.

```
110 REMark by Marcus Jeffery & Simon N Goodwin
120 :
150 CLS: RESTORE : READ space: start=RESPR(space)
160 PRINT "Loading Hex..." : HEX_LOAD start
170 INPUT "Save to file...";f$
180 SBYTES f$,start,byte : STOP
190 :
200 DEFine FuNction DECIMAL(x)
210 RETurn CODE(h$(x))-48-7*(h$(x)>"9")
220 END DEFine DECIMAL
230 :
240 DEFine PROCedure HEX_LOAD(start)
290 byte = 0 : checksum = 0
300 REPeat load_hex_digits
310    READ h$
320    IF h$="*" : EXIT load_hex_digits
330    IF LEN(h$) MOD 2
340       PRINT"Odd number of hex digits in: ";h$
350       STOP
360    END IF
370    FOR b = 1 TO LEN(h$) STEP 2
380       hb = DECIMAL(b) : lb = DECIMAL(b+1)
390       IF hb<0 OR hb>15 OR lb<0 OR lb>15
400          PRINT"Illegal hex digit in: ";h$ : STOP
420       END IF
430       POKE start+byte,16*hb+lb
440       checksum = checksum + 16*hb + lb
450       byte = byte + 1
460    END FOR b
470 END REPeat load_hex_digits
480 READ check
490 IF check <> checksum
500    PRINT"Checksum incorrect. Recheck data.":STOP
520 END IF
530 PRINT"Checksum correct, data entered at: ";start
560 END DEFine HEX_LOAD
570 :
580 REMark Space requirements for the machine code
590 DATA 404
600 :
630 REMark Machine code data
640 DATA "43FA018034780110","4ED241EB0018BBC8"
650 DATA "660000962E2E0058","518D307801184E90"
660 DATA "6600008828718800","2A31E8046F7A264D"
670 DATA "508D347801164E92","66703431E8006F68"
680 DATA "48C22605968265564","204C7C001231E802"
690 DATA "615E55826B0000F0","47E900031A013002"
700 DATA "1231E803614A1381","E803528951C8FFF2"
710 DATA "4A066774538B1785","E800524249FA0002"
720 DATA "72208218B20557CB","FFF8660000EA224B"
730 DATA "45E8FFFF3802121A","6116B231E8005289"
740 DATA "56CCFFF466E06062","70F14E757200605E"
750 DATA "0C0100416B1C0C01","00AB62164A016B14"
760 DATA "0C01005A631A0C01","006165060C01007A"
770 DATA "63124E750C0100A0","640A0C01008B62F2"
780 DATA "004100207C014E75","49FA0002BA1857CB"
790 DATA "FFFC66000082224B","24483802101AB031"
800 DATA "E800528956CCFFF6","66E4220853815D87"
810 DATA "2D470058224738O1","2A01671C383C081F"
820 DATA "D281691453442A01","70102205E1A16904"
830 DATA "98402A01E24066F2","2385E8023384E800"
840 DATA "7[illegible]270004E754A06","672049FA00027020"
850 DATA "8[illegible]8B20057CBFFF8","661C10011228FFFF"
860 DATA "6100FF4EB20067A2","4ED449FA0002B218"
870 DATA "57CBFFFC67945243","4A836700FF305383"
880 DATA "4ED40000000000O1","FE82074D53454152"
890 DATA "43480000","**",35238
```

HARDY hints

Perennial solutions to perennial problems. If you have any favourites, please send them in. This month: two non-technical topics: out-of-print books, and the missing Ansaphone advice.

Looking for a Book?

Many titles written for the QL in the boom-days of 1984 and 1985 are now out of print and hard to get hold of.

In some cases, well-known publishers like the popular Sunshine Publications have ceased to exist, as the "home micro" culture has narrowed down and the writers and publishers have gone on to other things.

There are ways, however, for the patient to find out-of-print books.

The obvious method is the second-hand market, through computer fairs, or ex-users advertising kit for sale. You can appeal through the letters pages of many magazines for people to sell their older books, although offers to sell your own books may be diverted to the small ads department!

Another source, often overlooked, is your local library. For a fee (usually around 50p, with discounts for pensioners, etc.) you can fill in an order with the title and author's name. If you know the publisher and approximate date of publication, this helps. The library will try to borrow the book from another branch.

This may take time, but is surprisingly effective. Warning: if you lose a book you have borrowed, you will be charged for it! Be aware of this if you are borrowing an expensive hardback title, which can typically cost £40, and sometimes more.

To find out if a UK book is currently in print, check a reference work called (surprise) British Books in Print. This is held (often on microfiche) by most libraries and many bookshops. But do not be discouraged if the title is not in print - it may still be in a library somewhere.

When buying books, note 'in print' may nevertheless mean 'out of stock'. This means that the publisher needs another printing, and may pause for several months to gauge the level of demand. Your bookseller can often find out how long the wait may be (but a library will not have this information, as they do not deal with retail suppliers).

PHONE ALONE!

A very eminent QL supplier (who usually answers his phone himself) has asked me to say a few words about Telephone Answering Machines.

So, unaccustomed as I am ...

It has come to our attention that somebody out there doesn't like talking to telephone answering machines.

(Seriously? Someone who spends hours talking to a computer, doesn't want to talk to a 'phone unless there's a human on the other end?)

Most QL suppliers are small, dedicated businesses. Some of them have other work, or have to get out and about to see their own suppliers, programmers, customers. Some of them have day-jobs. Answering machines get a lot of use.

It's frustrating when clients (or prospective clients) won't call with queries because they don't like talking to the answering machine.

Normally, businesses will call back the same day or the following day. Sometimes the Proprietor may be away for a couple of days or a week.

Small businesses rely heavily on answering machines - Digital Precision had no end of trouble when a line fault tied up theirs for several weeks last February.

QL suppliers usually give a fine personal service once contact has been made, so persist.

Here are a few tips, gathered from satisfied Answering Machine users:

Be patient. All the waffle on the recording is your supplier trying to be helpful. Most callers would prefer a short, blunt message, but suppliers feel that they must be polite and informative. Give them the benefit of the doubt.

Leave your name, telephone number (including the local area code), and a summary of your query.

For example "This is Fred Bloggs, 0123 680008. My QL has blown up/Trump Card has fallen out/(recent purchase) won't work/printer driver is refusing to print/order hasn't arrived. Please could you call me? (After 6pm, soon, any time, etc.)" Or - "I am a recent client of yours. Please could you call me back?" "Please could I have a copy of your price list? My address is (etc.)"

ALWAYS leave your number unless it is someone you talk to very frequently. Don't leave them to look it up in correspondence, even if you wrote or called yesterday - they have hundreds or thousands of letters. Be efficient.

Be prepared for your target to be out. If you like, jot down what you want to say in advance. Keep it brief and to the point. (This can be a helpful conversation-opener, if you have a complicated query, even if your supplier answers in person.)

If you have a very complex or serious query, write first and follow up with a call. Be realistic about how soon your letter will reach them and how soon they may be able to find a possible solution. Keep a copy of your letter to hand for when you call/they call.

Don't worry about sounding silly on the tape. Everyone sounds silly on tape. It's no different from television, except that you don't risk looking silly as well.

Bear in mind that you rarely sound as silly as the person whose voice is already on the tape.

The telephone, while no conversationalist, is also no critic of what you are saying or (if it is) has never told anyone.

Computer users talk to their computers. We've all heard them. What they say is often not fit for public consumption. Why be shy about being polite to a telephone?

If you do feel like saying something rude, bear in mind that this may discourage the owner from calling back. Get them on the line before you give them an earful.

Avoid calling early or late, as many people have their machines within ringing distances of their sleeping quarters.

Bear in mind that if they phone you back, they are footing the phone bill.

Get your own back. Buy an answering machine.

Reader Survey Results

Be concise!!

We asked every single reader of QL World to send us a completed Readers' Survey. Well - you didn't. Are we disappointed? Not a bit. We received nearly 250 completed survey forms - well above the 2% statistical norm. Frankly, if we'd had any more, we would still be climbing over them well into the summer!

We've done some graphs on the areas which it's easiest to present block figures for. But there's more to tell.

By far the greatest use the QL is put to is word processing. Hardly surprising - whatever their other interests, nearly everyone writes letters. Nearly 90% of users named wordprocessing as a main or important QL activity. What impressed us was the overwhelming support for Quill. 36% of you named it specifically as your favourite or only wordprocessor. 30% named the other two favourite WPs - Perfection and text87 - between them, with a split as near equal as makes no difference. Another 5% named The Editor as their favourite.

Text87 has been around for longer, of course - but a few readers mentioned that they were saving up for Perfection! But there is clearly a big section of the QL community who have either never tried another wordprocessor, or decided they don't want to switch yet.

A few users use two or more of the WPs mentioned here.

Databasing was not far behind wordprocessing. Around 80% of readers like to read about Archive and other databases, although more were in the "sometimes' category in this case. Archive is the clear leader, with Flashback getting many mentions, and DataDesign a significant number. Use of Abacus and other spreadsheets has a similar profile, with QSpread as the only spreadsheet apart from Abacus with a significant number of mentions. But Abacus was the clear leader.

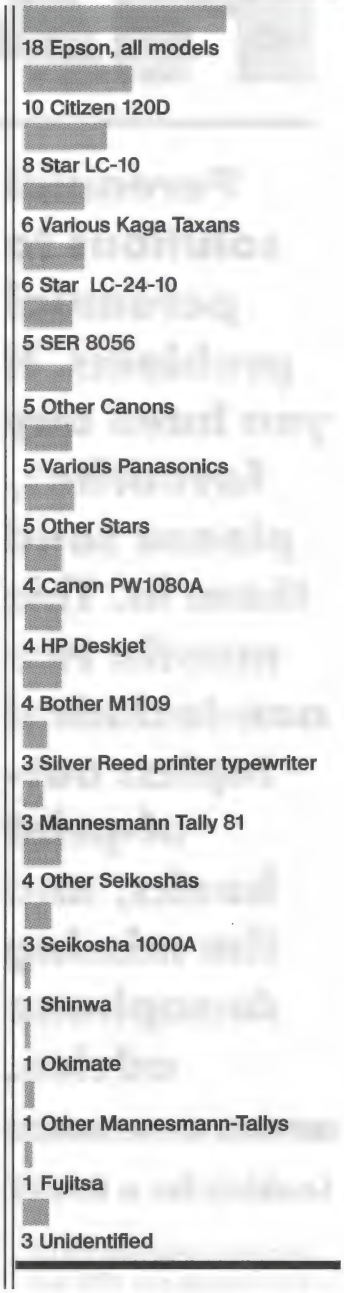
Clearly the Psion Four, which must be in the possession of nearly every single QL owner, has done a great deal of service over the years, despite the well-rehearsed complaints about Quill's difficulties with large documents, and how difficult Archive is to learn.

In the popularity stakes for general articles, reviews and reports on software were a clear winner, with 43% of readers reading them earnestly. Hardware articles followed some way behind with a substantial 29%, closely followed by Bryan Davies' general and consumer column Troubleshooter at 28%, news pages QL Scene at 27%, short program listings at 25%, letters page Open Channel at 24%, Simon Goodwin's machine code listings series DIY Toolkit, at 23%, and the tear-out-and-keep New User Guide at 20%, with other readers commenting that they don't so much read it as keep it.

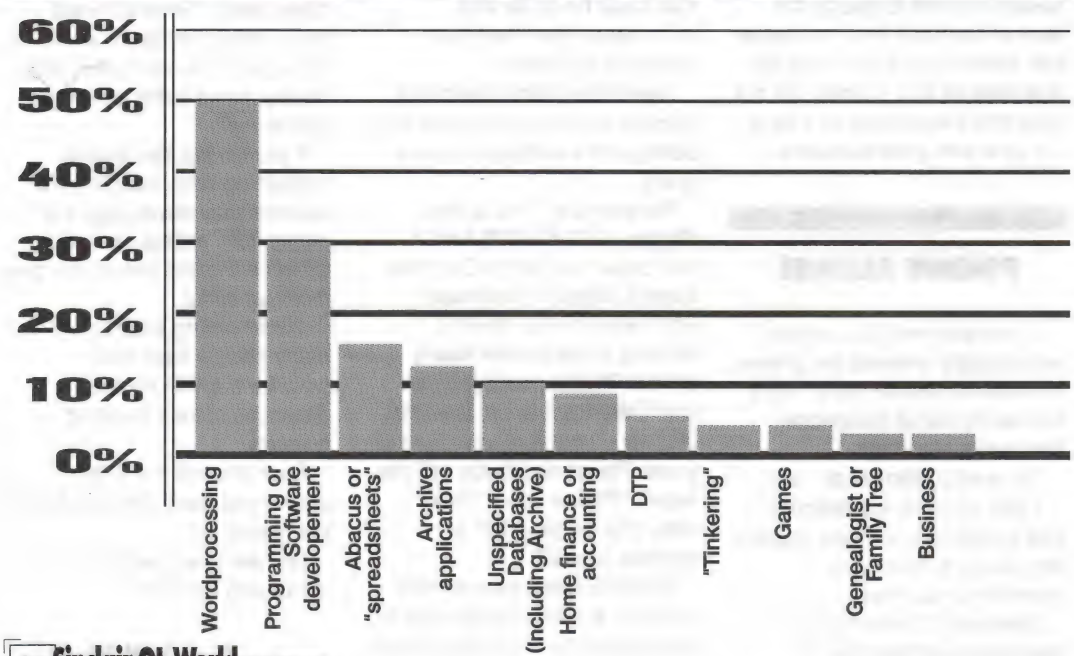
Below this figure we are moving into specialist subjects, but Alan Bridewell's Machine Code series, Geoff Wicks' DTP series, and long program listings show between 10 and 15% 'earnest reading', with another 7% reading show reports and 3% reading games reviews.

Naturally, the subjects which a few people read with greatest earnestness are the ones which a large number of readers avoid. Machine code, games reviews, DTP, and large programs (in that order) are all clear leaders in the "don't read" stakes. But they also figure among the subjects that some people ask for by name, and 'short programs' made a notable showing in the 'sometimes read' column.

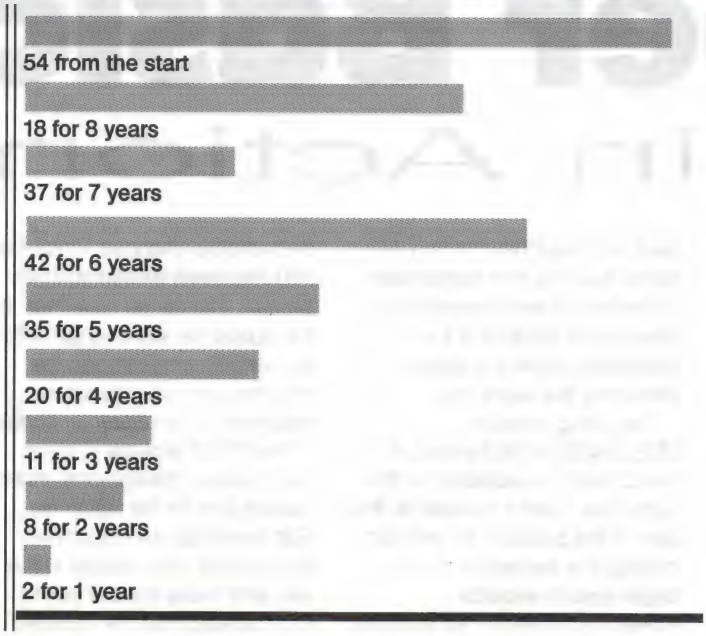
Printers - Sample of 100 users



Favourite use for the QL



How long have people read QL World?



Indeed, one of the clear messages of the Readers' Survey is that games are almost a dead issue on the QL, and most remaining games fans want 'serious' games like chess and card games.

Coming to what you want more of, software and hardware tips were clear leaders in the field, with profiles of QL Suppliers making a strong showing, followed by Superbasic program listings, and databases. The desire for more information on other computers and languages was more modest. Yes, you would like more photographs, but you think you get enough club news.

About 60% of users have some interest in other Sinclair computers, with the Z88 (often used as a portable "extension") as clear leader, followed by the Spectrum. Only about 40% of users want infomration on non-Sinclair machines. STs and Amigas are mentioned frequently, and PCs get a number of mentions. Macs, Archimedes, BBC machines and the ZX81 get a few mentions. There is only modest support for emulators of any kind.

What did readers 'ask for by name' in the suggestions section? More information for novices; the Pointer Environment; suppliers and other celebrities guesting as columnists; old software and software houses; hardware interfacing; more on boot files; "bug hunting' in commercial software'; finance; setting up ramdisks; small hardware projects; cover disks; Forth and C.

The upright headlines weren't popular, and Stevie has taken this to heart (so please stop sticking pins in his image! We need him!). Many readers wished us well. But to my surprise, more than half our respondents didn't make any additional suggestions at all! I hope that this means we are getting it right.

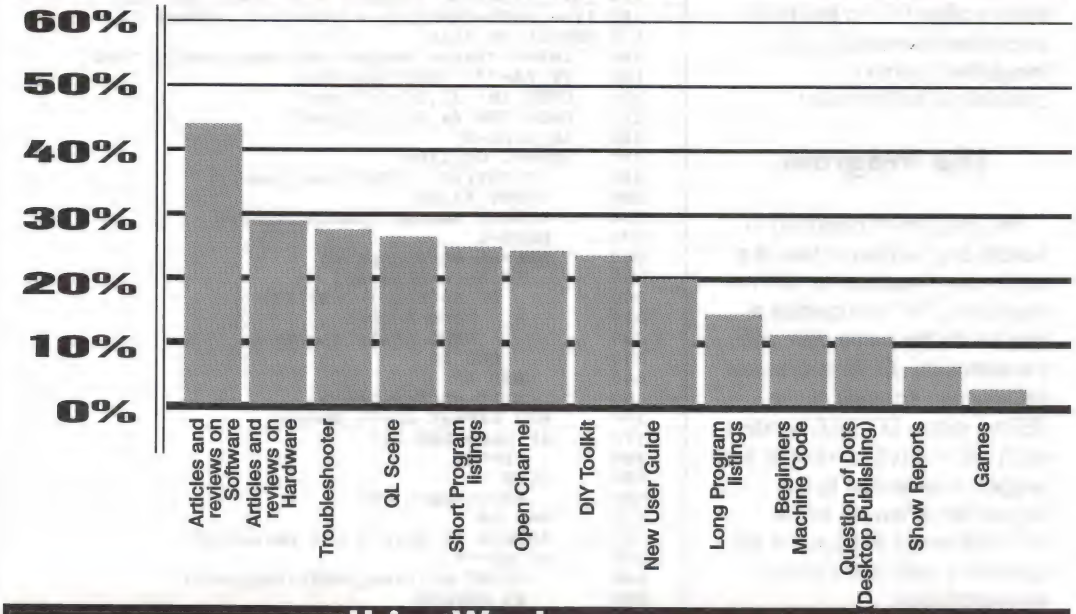
"How long" shows that the majority of QL World readers have either been with us since the beginning, or for a very long time. "Always", "All its life", "Forever!", they say. Just like St. Valentine's day! Even so, there are significant numbers who have come in in the last four years.

The section on Printers was fascinating in its diversity. As a single model, the Citizen 120D was a clear leader in our sample, although Epson was (perhaps unsurprisingly) the most popular brand name. Star printers also had a fair support. Otherwise, it was all comers! Small wonder that printer problems are perhaps our most perennial cause of calls for help.

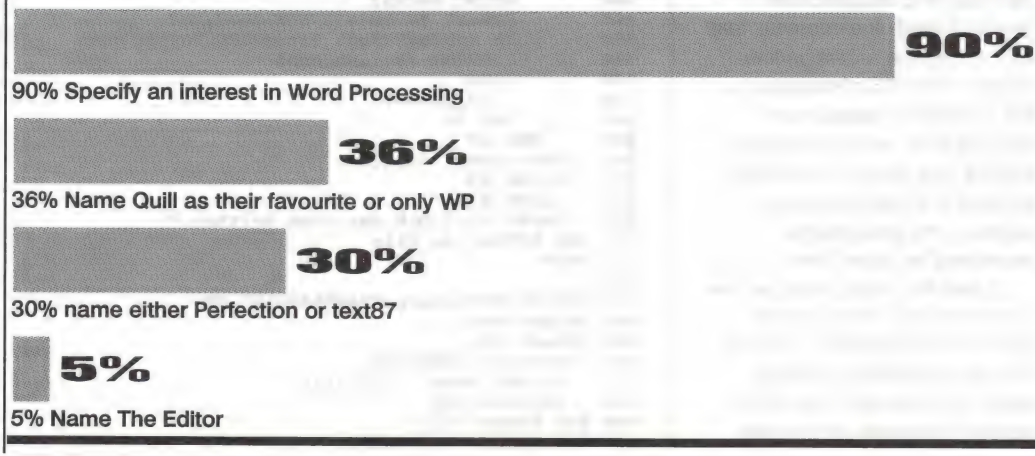
I hope that hardware traders, and other knowledgeable people who have often told me that they don't have time to write, or don't know how to put their knowledge on paper, will take the cry for tips and details to heart and respond to my call for more specialist information from the experts, even (indeed, preferably) in small bites.

There are many areas we can work on, but 84% of our respondents (even those with stern demands) put most of their QL World under the "Always read" or "Read Earnestly" columns. Thank you to all our respondents, and congratulations to the Subscription Prizewinner, who will be notified soon.

QL World readers "read arnestly"



Using Wordprocessors



Super Basic in Action

Simon Goodwin on how to convert QL Ascii files for use on other machines.

This month's SuperBasic example translates QL text files into a form suitable for typesetting in magazines such as the one you are reading. RAWTEXT has evolved since Sinclair QL World became able to receive copy on disk, rather than on paper.

RAWTEXT illustrates the difference between QL and PC text file formats, and the special requirements of typesetting. You could use or adapt the program to convert your own text, for *QL World* or other purposes.

Hot metal

Before Arcwind took over the magazine, columns were laboriously and sometimes imaginatively re-keyed for typesetting, leading to confusion and errors. Now my articles reach you directly from the QL keyboard, with only minor formatting changes (and the occasional intervention from the editor) en route, but a succession of automatic programs are needed to get the text from my desk to yours.

I write articles using *Quill, Xchange* or *TurboQuill* on a QL or emulator. These programs save QL-specific _DOC files which are not directly readable on other systems, so I use Dave Walker's *Textidy* utility to convert the finished document into a QL text file, similar to the output of QL text editors. Some QL users install a special Quill printer driver to get the same effect.

Editor Helen Armstrong enters or edits submissions on an industrial-strength PC-compatible computer, before referring them for page make-up on the Apple Macintoshes, which in this context are virtually dedicated desktop publishing machines. The program listed here converts QL text to suit PC conventions, before the file is transferred on a 720K MS-DOS-formatted disk. I write the PC files to disk with *Discover,* another Dave Walker program from Dilwyn Jones Computing. Textidy and Discover have proved to be the most popular and successful toolkit for this sort of conversion on the QL, but there are plenty of alternatives, such as QLIBM from Quanta and QLCF, *Xover,* or the ATR device. Some of these programs or equivalents come as part of larger packages like *PC Conqueror.*

The standard method for converting other computers' files for the Mac is via PC file format, whose conversion routines are built-in to the Macs. Happily, this is also compatible with the editor's office PC. So this is the smoothest conversion path - things that count in a commercial environment.

The Program

The program is designed to handle any number of files at a single run. It reads a file with the extension _TXT and creates a new file on the same drive with the extension _QLW. In overview, the program consists of two REPeat loops; DO_FILE handles each file in turn, till an empty line is typed in response to the request for a new file name. DO_LINE works through the file, converting each line into the required format.

One big difference between the input and output is the length of each line. Most QL text editors impose a limit on line length, often 255 characters, but the typesetting needs each paragraph to run continuously, without new lines in the middle, so RAWTEXT gathers lines together into paragraphs separated by blank lines.

QL text files have a single 'line feed' character at the end of each line, whereas PC systems use two characters, carriage return and line feed. The INPUT on line 250 reads up to a line feed, and the PRINT at line 440 sends two line end sequences at the end of each paragraph. One marks the end of the paragraph, while the second generates the blank line.

The string variable LINE_END$ holds the end-of-line characters expected in the output file. I use a variable at the start of the program so you can change the sequence if your target system expects something different - for instance a few computers use CHR$(13), carriage return alone.

The variable permits quick and reliable changes. Once line 160 has been altered you can be sure that all the new-lines in the output file will change, with no need to look through the program and change each instance of the character codes.

RAWTEXT expects a blank line between paragraphs; this is carried over to the _QLW file. Sub-headings and example commands may appear in the text, and these should not be incorporated into the following paragraph, so line 500 checks to see if the new line after a blank line has less than than a

```
100 REMark RAWTEXT 0.4
110 REMark © 1992,93 Simon N Goodwin
120 CLS : CSIZE 2,1
130 PRINT "RAWTEXT converts _TXT to _QLW files"
140 CSIZE 1,0 : PRINT
150 full_line%=50 :REMark Min. chars per full line
160 line_end$=CHR$(13) & CHR$(10) :REMark CR + LF
170 REPeat do_file
180   INPUT "Enter device and name prefix ";f$
190   IF f$="" : EXIT do_file
200   OPEN_IN  #3,f$ & "_txt"
210   OPEN_NEW #4,f$ & "_qlw"
220   in_para=0
230   REPeat do_line
240     IF EOF(#3) : EXIT do_line
250     INPUT #3,a$
260     REMark Remove leading spaces
270     here=1
280     REPeat strip_spaces
290       IF here<=LEN(a$)
300         IF a$(here)=CHR$(32)
310           here=here+1
320           NEXT strip_spaces
330         END IF
340       END IF
350       EXIT strip_spaces
360     END REPeat strip_spaces
370     IF here>LEN(a$)
380       a$=""
390     ELSE
400       a$=a$(here TO)
410     END IF
420     REMark Is this a new paragraph?
430     IF a$=""
440       PRINT #4;line_end$;line_end$;
450       in_para=0
460     ELSE
470       TRANSLATE "£","ß"
480       PRINT #4;a$;
490       REMark Is this a sub-heading?
500       IF LEN(a$)<full_line% AND NOT in_para
510         PRINT #4;line_end$;
520       ELSE
530         in_para=1
540       END IF
550     END IF
560   END REPeat do_line
570   CLOSE #3
580   CLOSE #4
590   PRINT f$;"_QLW has been written."
600 END REPeat do_file
610 STOP
620 :
630 DEFine PROCedure TRANSLATE(t$,r$)
640 LOCal here
650 REPeat fix
660   here=t$ INSTR a$
670   IF NOT here : EXIT fix
680   a$(here)=r$
690 END REPeat fix
700 END DEFine TRANSLATE
```

pre-set minimum number of characters.

Line 150 sets FULL_LINE% to 50 characters, allowing examples and sub-heading up to this length before incorporating them into the next paragraph. This suits my files, which start out left justified across 64 columns, but you may like to change it if you use a different page width.

The idea is to ensure that when a long word is wrapped to the next line of a paragraph the preceding short line is not treated as a heading, even if it is the first in a paragraph. If you use lines of up to 80 characters, and avoid words more than 15 letters long, you might set FULL_LINE% to 64, being 80-15-1 (allowing for the space between words). Problems are unlikely after the first line of a paragraph, as IN_PARA is set so the test in line 500 always fails, but the blank line between paragraphs and before headings is vital.

Translation

The QL and PC character sets correspond closely if you stick to the Ascii code range 32-127, but one important difference is the code for the pound sign, 96 on the QL but 156 on a PC. Line 470 calls TRANSLATE, a procedure that scans A$ and replaces instances of the first parameter with the second.

TRANSLATE has been written as a separate procedure, at the end of the listing, to make it easy to call repeatedly if you decide to use other characters - but unless you're careful this can result in mis-translation, which is why I usually write 'pounds' as a word in my articles. You might like to make A$ a parameter, as well as the other variables, if you wish to use TRANSLATE in another program.

Best Spacing

Unless you remember to reset Quill's margins, each line starts with a group of spaces. These must be removed before typesetting, or irregular gaps would appear in the text. The loop from line 270 to 410 does the trick, scanning the line from the first character, advancing HERE, the position in the line, as space characters are found. Notice that the check on the length of the string precedes the character comparison at line 300 - otherwise an empty line or a line full of spaces might cause an out-of-range error by looking past the end of the string.

If the entire line has been scanned, line 380 sets A$ to a null (empty) string; alternatively line 400 discards all characters up to the first non-space, at HERE. It is much more efficient to remove all the spaces in one step than it would be to delete them one at a time while scanning, as SuperBasic needs to find a new space for A$ after each change.

Textidy puts a space at the end of each line converted from a QL _DOC, but this may not appear if your file was generated in a QL text editor like ED, QED, Devpac, The Editor or Spy. In such cases RAWTEXT must add a single space at the end of each line inside a paragraph, so the last word of one line is separated from the first word of the next. To ensure this, add the following line:

```
535 PRINT #4;CHR$(32);
```

RAWTEXT should help new authors contribute to QL World with ease; it should also come in useful when converting QL text to other systems.

SuperBasic in Action aims to introduce and explain useful SuperBasic routines; I welcome suggestions for future articles.

(Note for would-be contributors. Welcome. Please remember: whatever you do to the text, it still has to be on an MS-DOS formatted disk. Don't try and outwit the system. I have often wished to strangle clever contributors who sent me ingenious file formats full of hidden codes that nobody was aware of until the Macs, or even the PC, refused to read them. Even Simon didn't work it out till we gave him one of Bryan's PC files to dissect. If in doubt, write to me for advice. The standard layout for both disk files and hardcopy is single-spaced, one line space between paragraphs, no page numbers, boldface, centred headlines, etc. Listings in camera-ready hardcopy only! - The Editor.)

BOOK REVIEWS

More book reviews, this time from Graeme Young and one leftover from Simon (the TV man) from august 92. QL World January 1992

Title: QL SuperBasic, The Definitive Handbook
Author:Jan Jones
Publisher: McGraw-Hill UK Ltd 1985; Quanta, 1990
Price: £10 (UK), £12 (abroad)
Available: Quanta (0933) 460690
QL-specific: Yes
Format: Paperback then Ring-bound reprint, 261 pages

In 1983 Jan Jones designed SuperBasic for Sinclair's unreleased Super Spectrum; in 1984 it became the built-in language of the QL The 'definitive handbook' was published with little fanfare in 1985, but has since been re-printed by the user group Quanta.

This is the authoritative source of information on the syntax, semantics and inner workings of SuperBasic. It contains much technical information, yet the style is friendly and inventive; for instance, Jan Jones illustrates structured programming with a seven-step plan for feeding cats!

The handbook is full of detail, but this makes the content easy to follow because nothing is missed out. As each Basic feature is explained, the author notes its effects inside the QL memory. The interpreter is presented as a coherent whole.

The handbook contains dozens of short example programs, and works well as a reference guide once the tutorials have been completed. It ends with syntax graphs, an 18 page alphabetic guide to keywords, and a 50 page index.

Like most QL books this volume assumes the AH and JM rom versions, omitting variables added by later roms and Toolkits. Apparently a chapter on the WHEN keywords was written, but omitted at Sinclair's insistence, probably because of the many uncorrected bugs in JS and MG roms.

The book does not detail SuperBasic bugs, understandably as rom development continued while it was written. The inner details of SuperBasic areas are useful to those who wish to PEEK and POKE therein, but mask some changes; for instance the Name Table pointers in the Return Stack hold offsets relative to A6, on AH and JM roms, but offsets from the Name Table base, later.

The presentation of the book is adequate but does not do justice to the content, with typewriter-style text and murky diagrams. An explanation of 'overflow' errors stops in mid-sentence, and a line is repeated at the end of the next page.

Values stored by POKE_W and POKE_L are mis-stated, actually -32768 to 32767 or -2147483648 to +2147483647. INKEY$ defaults to channel #0, not #1. The maximum number of tasks is 56, as stated, on a 128K QL, but rises to 120 with 256K or more ram expansion. Units of BEEP duration are not 72 microseconds, but depend on pitch and other parameters, typically between 45 and 65 microseconds.

Despite minor flaws this book deserves the title 'definitive'. It is the best SuperBasic tutorial available, required reading for anyone confused by the 'Beginners Guide', 'Concepts' or 'Keywords' sections of Sinclair's QL User Guide. It contains much information unavailable elsewhere; apparently QLiberator could not have been written without it. Need I say more?

Simon Goodwin

Title: Mathematics on the Sinclair QL
Author: Czes Kosniowski
Publisher: Sunshine Books (Scot Press)
Price: (Originally) £6.95
Currently available: Probably only second hand
QL specific: Yes

Many of the books published on QL matters relate to the bundled software that accompanied the computer, and it was refreshing to come across one which handled in simple language the subject of mathematics, pure computing, in fact.The treatment is totally practical, a subject is explained from the mathematical angle first, and then hhow it is programmed for the QL Fairly complex operations are expalined with clarity, reading the book is enjoyable, and copious program listings bring the bok to life at the kayboard.

Fourteen chapters cover subjects from simple routines such as integers and crash-proof entry of numbers, through trigonometry, powers, sequences and primes to matrices and codes. The book closes with some useful games routines such as dice-rolling, and a chapter on meaningful data - means, standard deviation, confidence intervals and data analysis. The chapters on trigonometry made a program listing on synchronous-orbit satellite antenna setting obtained from antoehr source much easier to understand and adaprt to more parochial purposes. The tackling of quadratic equations was something I left behind at school (thankfully), but a brief explanation of their solution on the QL has taken the terror out of them for ever.

This is a book which helped me to discover more about the QL and its programming. Obviously the author knows and loves the computer. In the chapter on Days and Weeks, procedures are listed for calculating the day of the week for any date specified since 1752, and a calendar program for printing the days/dates of any month. The usefulness of these procedures is plain to anyone who has to plan dates ahead, check back in time for whatever reason, write a Biorhythm program, or just find out on what day of the week one was born. Like it or not, mathematics plays an important role in our lives and a better understanding of the subject gives one an advantage. This book certainly helps, and fgor anyone still exploring the mathematical functions available on the QL it will provide an invaluable guide to them, their use, and how they can be incorporated into programs.

Have you ever heard of the Sieve of Eratosthenes? It is a simple but laborious method of determining a prime number (any number not exactly divisible by any positive integer apart from 1 and itself). Kosniowski gives us no less than three listings for programs of varying efficiency that will test a number to see if it's a prime. The chapter goes on to Mersenne primes and further listings for testing for primarity of very large numbers.

If your mathematics is a bit hazy and in need of polishing up, this is the book to seek out when you next visit a QL fair. It's large enough to be satisfying, but concise enough not to be formidible.

Graeme Young

Title: QL Easel
Author: Alison Spottiswoode
Publisher: Century Communications
Price: (1984) £7.95

Currently available: Not known
QL specific? Yes

QL Easel is one of a set of five handbooks covering the Psion bundled software for the QL. Alison Spottiswoode has had a long experience of the design of computer software for inexperienced people, and also read Natural Sciences at Cambridge University. Her book on Easel, as a result, is highly entertaining as well as to the point.

After an introductoin to the Blake family, about ten pages are devoted to loading Easel and getting used to the screen layout and variousfunction keys. From Chapter 2 onwards, the Blake family step forward and their lives are analysed into bar-graphs, line graphs and pie charts. Cartoons are liberally but not excessively used throughout the book, and real printouts from an FX-80 are used to display the results. Sadly, the section near the end of the book on hard-copy says very little that is useful, but in 1984 it was considered adventurous to connect any printer other than the FX80 (or, later, the Serial 8056) to the QL.

The best way to use the handbook is to regard oneself as totally ignorant of Easel. Commence at the Preface and work through the book sequentially to the end. On the way through, you will be taught subtly but positively all about Easel, quite a lot about hte QL, and how to select the best presentation of data in graph form. Once you have reached the end you will be recognising Blake characteristics in many of your neighbours and friends, and QL Easel will become a true handbook, to be dipped into whenever the need arises.

Graeme Young

Title: Basic Programming on the QL
Authors: Neil and Pat Cryer
Publisher: Prentice Hall International
Price: (1985) £7.95
Currently available: second hand
QL specific: Yes

As with many other books on the QL, this begins with the fundamental steps to the use of the machine, but repidly goes on to rudimentary programming. THe first chapter deals with direct inputs, progresses to the use of programs, and simple editing. It discusses the main points of the chapter and suggests some activities which would give practical experience of the points raised in the chapter. This technique is used throughout the book to great effect. The concept of procedures and fucntions is introduced naturally right at the start, and to anyone who has not programmed in any other Basic, except BBC-Basic possibly, it would seem to be the only logical way to write SuperBasic programs.

Chapters follow on SAVEing, LOADing and MERGEing programs, syntac, keywords, entering data, FOR and REPeat loops, IF, THEN, ELSE, ON ... SELect, sound, graphics, colour, arrays, functions and files. The final chapter is on structured programming and servies to set the seal on SuperBasic programming by the use of flowcharts. THese are cited as useful aids to defining the program structure and can convert easily to a SuperBasic program with minimum effort. At the end there is a games program which exemplifies many of the procedures and functions discussed throughout the book, and the inevitable "Glossary of Terms" ends the book. However, even this is well explained and merits a second look.

From beginning to end the book is well-illustrated, the programs all work, and great care is taken to explain the syntax of program lines by the use of circles and arrows. As each new feature is covered there is a paragraph of suggested "activities" which highlight the preceding programming and demonstrate any hidden disadvantages of using it. Lessons are leanred in this way for keeps, and thought is stimulated. Basic Programming on the QL is a book that one should work through from beginning to end in the first instance. Thereafter, it remains a useful reference manual and can take pride of place on the shelf alongside Jan Jones' *QL SuperBasic*.

Graeme Young

Title: QDOS Reference Manual
Publisher: Jochen Merz, Im Stillen Winkel 12, W-4100 Duisburg 11, Germany.
Price: £27 plus £4 carriage
Available: From Merz as stated.
QL-specific: Yes

This book has recently been released by Jochen Merz as a replacement for the various books on the QL operating system that have been around for several years, such as Colin Opie's QL Assembly Language Programming and Andrew Pennell's Sinclair QDOS Companion. The problem with the older books on this subject are that they were written (mainly) quite early in the QL's life and as such do not cover improvements introduced by JS and MG roms. They also contain various minor errors which can create havoc with machine code programs.

The QDOS Reference Manual comes in a large A5 ring binder containing over 170 pages. Although a book of this size is bound to contain a few errors, the offending pages can now be replaced quite easily, and for an extra £12, the purchaser will receive four updates to the book as they emerge. What is more, not only does this book contain system information on all of the QL roms (from FB to MG), it also goes on to describe the interface to the Hotkey System II and the Thing system introduced by QJump. Level 2 Device Drivers (provided on Miracle System's Gold Card and the QL Emulator for the Atari ST) are also covered, although no mention is made of Minerva in current versions of the book.

The book is split into eighteen sections, and users may find it easier if they obtain some dividers to place between each section (Jochen supplied me with some of these free of charge!). Each section concerns a specific area of the QL operating system and makes it easier to find anything. The first twelve sections act as an introduction to Qdos, providing information on the memory map of the QL and general information on how to access Qdos. This certainly contains all of the information that you would expect to find in such a book, although these sections do sorely lack an index. Much of this (like other Qdos books) may be beyond the average QL user, but then again, there is no real need to understand most of this in order to use Qdos in simple machine code programs.

The subjects covered include details of the various device drivers (including those available as standard on the ST-QL emulator); linking with SuperBasic; direct access to the Microdrives; details of the translate table introduced in the JS rom (and never before documented); and much more.

Sections thirteen to fifteen contain a decription of all of the operating system calls accessed via TRAP #1 to TRAP #3, providing details of the parameters which must be passed and the return parameters. Each description has notes concerning the difference in operation of the call on different QL roms. The calls are not in numeric order, but are apparently collated in groups of similar commands. Luckily each section has its own index to enable you to find the desired call more easily. Unlike earlier Qdos books, the names of the calls are in SMS-2 notation which follows the notation used by the QL Technical Guide, but can make it more difficult to follow Simon Goodwin's DIY Toolkit articles which use the alternative notation. I understand that Jochen is considering inserting an appendix in the book which will list all of the calls with both the standard notation and SMS-2 notation so that users can translate between the two. You will also find the calls listed which are necessary to access the Thing system and to set the translation table and error messages. Additional TRAP #3 calls are listed which allow you to access the Level-2 Device Drivers utilities (such as setting file versions and making directories). Oddly, there is no description for IOW.DONL (TRAP #3 with D0=$2F), although I assume that this will be corrected when the manual is next updated.

Section sixteen similarly details each of the operating system calls accessed via the Qdos vectors. There are however one

or two inconsistencies here with earlier Qdos documentation (mainly concerning the return parameters). I have notified these to Jochen and await a response as to which version is correct. Section seventeen contains a description of the Thing system and how to access it. An example is sorely lacking here and I have forwarded a suitable program to Jochen which he may consider including in future releases of the manual. Interfacing with the Hotkey System II and even the Button Frame is also dealt with (although the latter is sorely lacking in detail).

The final section in the book lists all of the different 'keys' used by Qdos (standard values for accessing various things), as well as providing details of Headers, system variables, Basic variables and the various definition blocks. I was pleased to note that the manual recognises the fact that the system variables do not appear at a set address in memory, but are in fact an offset from the base of the system variables returned by the TRAP #1 call, SMS.INFO.

Overall the book provides an excellent replacement for the now somewhat out-of-date earlier books. I do however feel that one or two more examples would have been of benefit, although once Jochen knows what users feel is lacking, I am certain that he will provide further details as required. I would have liked to have seen reference in the manual to the Thor's operating system Argos (I understand that Jochen does not have access to any details on this) and Minerva, but then there has to be a point at which any book publisher has to say that is enough. There are still one or two minor errors in the book, although thankfully these can now easily be replaced /updated. Although the book may at first seem a little over-priced, it provides the definitive up-to-date book on the Qdos operating system and as such should find a welcome place on many users bookshelves.

Rich Mellor

aCcLcesBs

AUSTRIA

DER Computer Club. Contact: Peter Postl, Stiegerg 5, 1150 Wien, Austria.

BELGIUM

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QL Contact France. Contact: Jean-Louis Dianoux, 38-40 Rue Stephenson, 75018 Paris, France.

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Sinclair QL User Club eV. Contact: Franz Herrmann, Talstrasse 21, d-W5460 Ochenfels, West Germany. Magazine: Quasar.

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Qitaly Club. Contact: Roberto Orlandi, Via Brescia 26, 25039 Traveglianto (BS), Italy. Tel. +39 30 6863311. Magazine: Qitaly Magazine. Editor: Dr Eros Forenzi, Via Valeriana 44, 23010 Berbenno (SO), Italy. Tel. +39 342 492323.

NORWAY

Norwegian All Sinclair Association (NASA). Contact: P Monstad, NASA, N-5580 Oelen, Norway. Magazine: Sinclair Magazine.

SCOTLAND

Scottish QL Users Group. Contact: Alan Pemberton, 65 Lingerwood Road, Newtongrange, Midlothian EH22 4QQ. Newsletter.

SPAIN

Qliper. Editor: Marcos Cruz, Acacias 44, (Monteclaro), E-28223, Pozuelo de Alarcon, Spain. Magazine: Qliper.

SWEDEN

International QL Conference bulletin board system (Swedish and English). Contact: Michael Cronsten, System Operator, Jamten-TCL, S Soere 1073, 83030 Lt, Sweden.

TURKEY

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QL MUG: 3 Barnard Road, Birkenhead, L43 1TT. (Also market a mouse.)

Solent sub-group: Graham Evans, 32 Reeves Way, Lowford, Bursledon, Southampton. Tel. 0703 403350.

USA

New England Sinclair QL User Group. Contact: Sherm Waterman, PO Box 8763, Boston MA 02114, USA. Magazine: NESQLUG News. Editor: Peter Hale, 195 Central Ave., Chelsea, MA 02150, USA.

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Notes:
Addresses are only given where there is no business line. For Fax numbers, phone dealer or check ad. in QL World. Only larger dealers have Fax, often on the same number. Some numbers no longer active in the QL world are given for reference and support queries.

Beginners' Machine Code

Part 2

Alan Bridewell continues with part 2 of his very basic approach to assembler programming.

In the first part of this series, we looked at a very simple form of instruction to place a particular number at a particular ram location, where both the number, and the ram address are mentioned specifically. This kind of instruction, although useful, is limited. It is often more convenient, and flexible, to refer to the places where the number and address are stored, so that the identical instruction can be used again when either the number, or the address, or both, have changed. These could, of course, be stored in ram addresses, and there are instructions to deal with this situation.

However, for the moment I wish to concentrate on some very important, and useful, places for storing this information. These are the Registers in the microprocessor, which is at the heart of the QL.

These registers are divided into two types, called DATA Registers and ADDRESS Registers. The two types are (oddly enough) identical, and so are interchangable in many situations. However, they are designed to be used in different ways, and there are slightly different sets of instructions to use with each function, so it is best to use each set of registers for the purpose intended. Let us deal with each type separately.

Registers

There are ten data registers, called D0 to D9. They can store numbers in byte, or word, or long word sizes. Numbers stored in the data registers can be used for any purpose, but the microprocessor regards them simply as numbers. Since they can be used for any purpose, they could be used for storing addresses in ram or rom. But there are no instructions designed to treat them as addresses, unlike the address registers, so we stick to using them for number storage.

As with data registers, there are ten address registers, called A0 to A9. Again, we could use these registers to store anything, but they have large numbers of instructions which are designed to treat their contents as addresses, and that is the way they should normally be used.

There are a few important syntax rules about the way we refer to address registers in our assembler code, and if we can learn these quickly, it will help greatly in the variety of instructions we can use. These rules are:

1. If we refer simply to the address register, eg A0, we mean 'deal with the contents of the register itself'.

2. If we put brackets round the address register, eg (A0), we mean 'treat the contents of the register as an address, and deal with the contents of that address'.

3. If we put a minus sign in front of the bracket, eg -(A0), we mean 'reduce the number in the register by 1, 2 or 4 (depending on whether we are dealing with byte, word, or long word sized data), and then treat the new contents of the register as an address, and deal with the contents of that address'. (This is referred to as Pre-decrementing, which means 'reducing beforehand'.)

4. If we put a plus sign after the bracket, eg (A0)+, it means we do exactly the same as 2, except that we increase the number in the register by 1, 2 or 4 (depending on the data size) AFTER we have finished carrying out the instruction. (This is called Post-incrementing, which means 'increasing afterwards'.)

Pre-decrementing and post-incrementing are a very useful way of moving data in and out of a large number of consecutive

LISTING 1

```
;*************************************************************************
;                    COLOURING A BLOCK USING A LOOP
;*************************************************************************
;
                    MOVEA.L    #$20000,A0          ; START ADDRESS IN A0
                    MOVE.W     #$8000,D0           ; LOOP COUNTER
                    MOVEQ      #$F0,D1             ; BYTE VALUE
.LOOP               MOVE.B     D1,(A0)+       ; MOVE THE CONTENTS OF D1 (#$F0)
                                              ; TO THE ADDRESS HELD IN A0,
                                              ; THEN INCREMENT A0
                    DBRA       D0,LOOP        ; IF D0 > 0, THEN DECREMENT D0
                                              ; AND BRANCH TO 'LOOP'
                                              ; IF D0 = 0, THEN LEAVE THE LOOP
                                              ; AND CONTINUE THE PROGRAM
                    MOVEQ      #$0,D0         ; NO ERROR RETURN
                    RTS                       ; RETURN TO SUPERBASIC
;
;*************************************************************************
```

addresses without the need for lots of extra instructions.

To make this quite clear, let us look at the effect of each type of instruction. Suppose the data register D1 contains the byte #$F0, and the address register A0 contains the long word #$20000 (which happen to be the address of the start of the screen ram). The instruction:

MOVE.B D1,A0

means 'make the contents of the A0 register what was in D1, ie #$F0, and discard what was already there, ie the number #$20000'. But this example is not much use if we wish to put something on the screen. The instruction:

MOVE.B D1,(A0)

means 'make the contents of the address $20000 into #$F0 and discard what was already there'. This will clearly put something on the screen, in the top left corner. The instruction

MOVE.B D1,-(A0)

means 'make the contents of A0 into #$1FFFF (reduce by 1 because we are dealing with byte sized data), then make the contents of address $1FFFF into #$F0, and discard what was already there.' This will probably have no effect at all on an unexpanded QL, but may affect an expanded QL because this address is reserved for use by expansion boards. Either way, it is not a desirable effect. The instruction:

MOVE.B D1,(A0)+

means 'make the contents of address $20000 into $F0, and discard what was already there, then make the contents of A0 into #$20001'. If we then repeat the instruction, the next time it will mean 'make the contents of address $20001 into #$F0, and discard what was already there, then make the contents of A0 into #$20002'. Clearly, what we have here is a method of filling up a set of consecutive screen ram addresses with the same data.

```
LISTING 2

100 z=RESPR(22)
110 LBYTES flp1_LISTING1_code,z
120 CALL z
130 PAUSE -1
```

```
LISTING 3

100 REMark Sinclair QL World HEX LOADER v 3
110 REMark by Marcus Jeffery & Simon N Goodwin
120 :
130 CLS: RESTORE :READ space:start=RESPR(space)
140 PRINT "Loading Hex...":HEX_LOAD start
150 INPUT "Save to file...";f$
160 SBYTES f$,start,byte:STOP
170 :
180 DEFine FuNction DECIMAL(x)
190 RETurn CODE(h$(x))-48-7*(h$(x)>"9")
200 END DEFine DECIMAL
210 :
220 DEFine PROCedure HEX_LOAD(start)
230 byte=0:checksum=0
240 REPeat load_hex_digits
250    READ h$
260    IF h$="*":EXIT load_hex_digits
270    IF LEN(h$) MOD 2
280       PRINT "Odd number of hex digits in: ";h$
290       STOP
300    END IF
310    FOR b=1 TO LEN(h$) STEP 2
320       hb=DECIMAL(b):lb=DECIMAL(b+1)
330       IF hb<0 OR hb>15 OR lb<0 OR lb>15
340          PRINT "Illegal hex digit in: ";h$:STOP
350       END IF
360       POKE start+byte,16*hb+lb
370       checksum=checksum+16*hb+lb
380       byte=byte+1
390    END FOR b
400 END REPeat load_hex_digits
410 READ check
420 IF check<>checksum
430    PRINT "Checksum incorrect. Recheck data. ":STOP
440 END IF
450 PRINT "Checksum correct. Data entered at: ";start
460 END DEFine HEX_LOAD
470 :
480 REMark Space requirements for the machine code
490 DATA 22
500 :
510 DATA "207C00020000": REMark        MOVEA.L    #$20000,A0
520 DATA "303C8000": REMark            MOVE.W     #$80000,D0
530 DATA "72F0": REMark                MOVEQ      #$F0,D1
540 DATA "10C1": REMark     .LOOP      MOVE.B     D1,(A0)+
550 DATA "51C8FFFC":REMark             DBRA       D0,LOOP
560 DATA "7000":REMark                 MOVEQ      #$0,D0
570 DATA "4E75":REMark                 RTS
580 DATA "*","2052"
```

Looping

What we now need is a suitable way of setting up a loop to repeat the instruction the number of times we want. The instruction we need for this is DBRA, which stands for "decrement and branch always". (Some assemblers may only accept the alternative DBF, which stands for "decrement and branch when false".) This is one of a large number of "decrement and branch if the condition is right" class of instructions, but is probably the most useful for the beginner. Let us look at exactly what it does. Suppose we use the command:

DBRA D0,LOOP

What this does first is to test the contents of the data register D0. If it finds the register contains a number greater than zero, it reduces the number by one, and then branches to the address of the label LOOP in the program. (We could, of course, have used any other data register besides D0. We could also have used an actual address number rather than an address label, but that is rather less flexible.) If it finds the register D0 contains zero (so that it can't decrement any further), it simply moves to the next instruction in the program.

What this means is that we can use the contents of register D0 as a loop counter, so that the set of instructions from LOOP to the DBRA instruction are repeated by the number of times given by the number in D0.

We now have enough information to write a short routine which will colour a continuous block of screen with a pattern of repeating bytes. What we will do is to fill the whole screen with a pattern of black and white vertical stripes. Listing one is the assembler program.

Breakdown

The program starts by setting up three registers with the important numbers needed for the program. The first line puts the start address of the screen ram ($20000) in address register A0. The MOVEA instruction is the same as a MOVE instruction, except that it stands for "move address", and only works with address registers. Many assemblers will accept an ordinary MOVE instruction as meaning the same thing. The second line put the number of bytes in the screen ram ($8000) put into data register D0 to make it our loop counter. The third line puts $F0 into data register D1, and this is the number we are going to put into every byte of the screen ram. By altering these numbers, you can colour part of

the screen instead of all of it, or produce some different repeating pattern.

The fourth line is the instruction we want to repeat over and over again filling up the entire screen ram with our data $F0. Remember, what it does is to put the number stored in D1 ($F0) into the address stored in A0 ($20000) before incrementing A0 to the next address. We are going to give this line a label, calling it "LOOP". The explanation for this will come shortly.

The fifth line is the one which either loops back to repeat the fourth line and decrement the loop counter, or move on to the next instruction if the loop counter has already reached zero.

Relocatable

We don't actually know the address of the fourth line until we know where the program has been loaded into ram, but by using the label "LOOP" to represent this address, we can be sure that the assembler will generate code which will branch to the correct address wherever the program is put in ram. The is called "relocatable code", and it is a very important part of machine code programming. In SuperBasic, we use the RESPR command to get the QL to find a suitable bit of unused ram to put our program into, which means the program must be capable of being loaded anywhere and still work. Programs that branch or jump to specific addresses are a thorough nuisance, because the code has to be loaded at a specific address to work. Some commercial programs do this, but it is generally regarded as bad programming.

Having completed what we intended, we should return to SuperBasic with the RTS instruction. However, before that, we have put in an extra instruction to make the contents of register D0 zero. This needs a short explanation. You should recall that in part one of this series the routine produced a "bad parameter" error on returning to SuperBasic. The reason for this was not explained at the time, because enough new things had been covered already. Here is the reason.

The QL operating system Qdos is continually checking for errors (that is, something it thinks should not have happened), and whenever it thinks it's found one it puts an "error code" into register D0. The programmer can then check the contents of register D0 to see if an error has been detected or if all is well. Zero indicates no error, and various other numbers are used to mean specific types of error.

Error check

Whenever a program returns to SuperBasic from a machine code subroutine, the interpreter checks D0 for an error. Good programmers can use this to check that all is well, or whether something went wrong. However, if we carelessly leave a non-zero number in D0 when we return to SuperBasic, the interpreter will think there has been an error even if there hasn't.

Of course, to avoid this problem, we could have avoided using register D0 in the first place. There are plenty of other registers to use. But as programs become bigger and more complex, it can soon become necessary to use D0 as well as all the other registers, so the problem cannot be avoided in real programming. In this example I did not avoid it because it is easy to deal with, and, anyway, I wanted to make this particular point early on.

Once again, we need a suitable SuperBasic program from which to load and run the machine code. Listing two does this. It assumes the code generated is in a file LISTING1_code on a disk in FLP1_. You may need to alter this to suit your circumstances. Having generated the pattern over the entire screen, it also then waits for a key to be pressed before returning you to the input cursor in #0, so that the scolling of #0 does not disrupt the pattern.

As in part one, I have used Marcus and Simon's Hex Loader routine for those who do not have an assembler, and added REMark statements to the DATA statements to show which assembler code produces which numbers.

Happy coding!

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